

Blockchain

Blockchain Technology

- A decentralized, distributed ledger system that records transactions and stores data in a secure and transparent manner.
- Used in various industries to securely store and transfer data and assets.
- Operates on the principles of decentralization and distributed ledger technologies, which make it immune to tampering and fraud.

Decentralization

- Refers to the absence of a central authority or middleman in a system, where power and decision-making are distributed among the participants.
- Ensures that there is no single point of failure or control, making the system more secure, transparent, and efficient.

Distributed Ledger Technologies

- Type of database that is spread across a network of computers, where each participant has a copy of the database.
- Unlike traditional centralized ledger systems, distributed ledger technologies do not have a single point of control, and all participants have equal authority.

Types of Blockchain

- Public blockchain: Open to anyone and operates on a consensus mechanism, providing maximum transparency and security.
 - Example: Bitcoin.
- Private blockchain: Controlled by a single organization and operates on a permissioned mechanism.
 - Example: JPMorgan's Quorum.
- Consortium blockchain: A hybrid between public and private blockchain, where a group of organizations controls the network.
 - Example: R3 Corda.

Applications of Blockchain



Applications Of Blockchain



Digital IDs



Bitcoin



Real estate



Voting



Payment and
Transfers



Health Care

Internet of Things



Online music



Banking

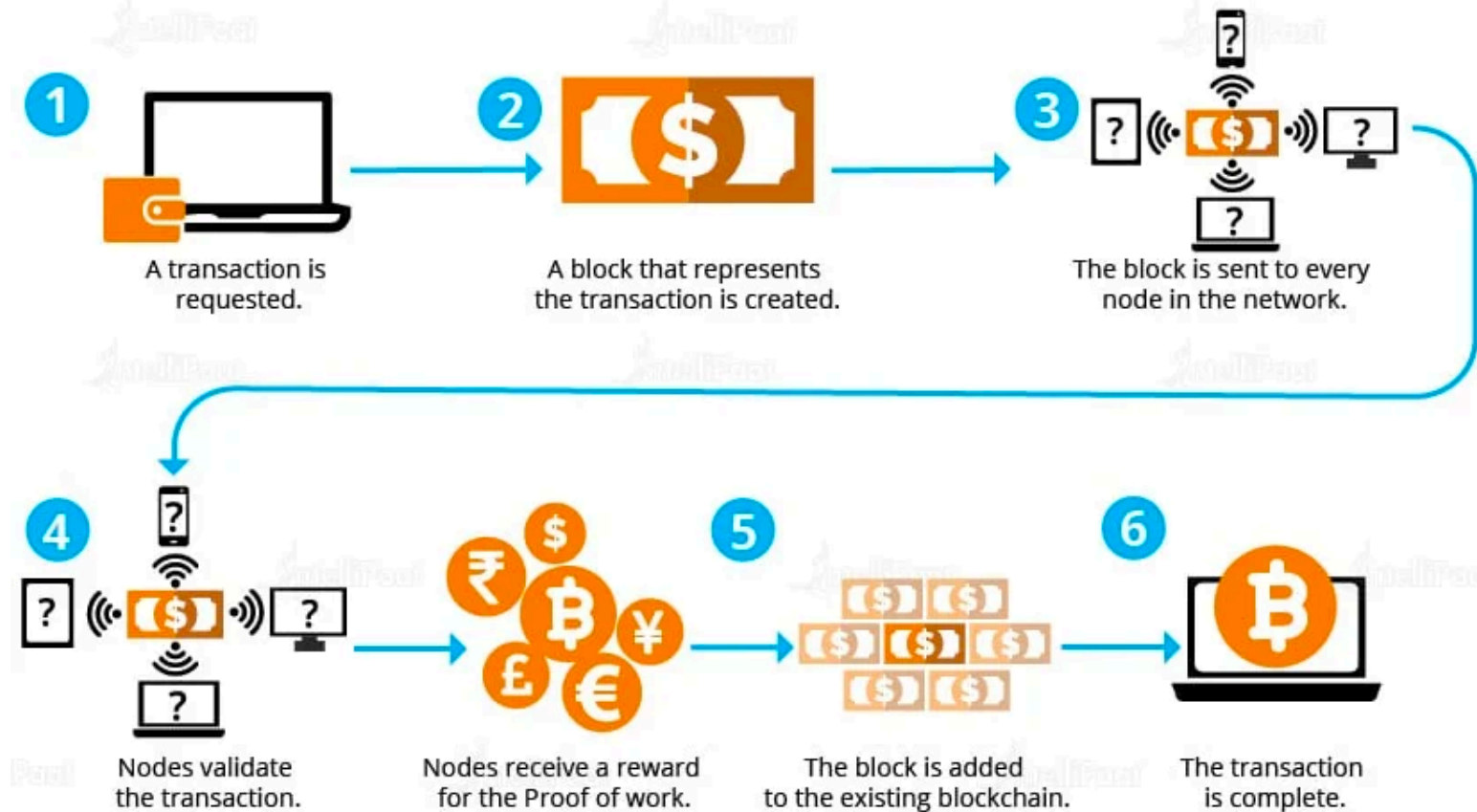


Law Enforcement

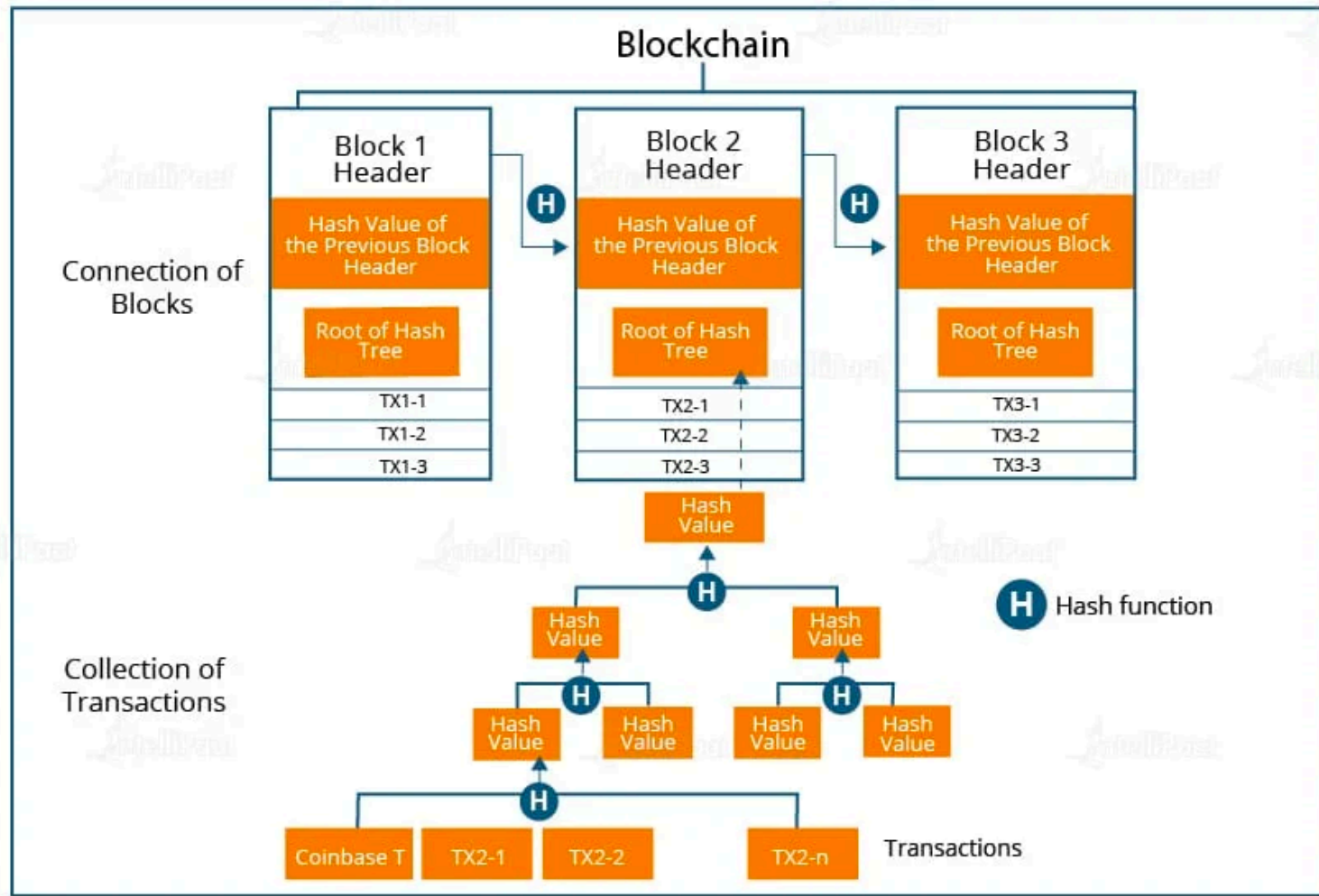
Transactions and Blocks

- Transactions are the transfer of assets or data between parties in a blockchain network.
- Blocks are the basic building blocks of a blockchain and contain a set of transactions. The blocks are linked to each other through cryptography, forming a chain of blocks, known as the blockchain.
- Blocks are essential to maintaining the integrity and security of transactions in a blockchain network. They ensure that once a transaction is recorded, it cannot be altered or deleted.

Blockchain Transaction



Structure of Blockchain



Digital Wallets

- A software program that stores the public and private keys of a user and facilitates the transfer of assets or data on a blockchain network.
- Types of digital wallets: There are two main types of digital wallets - hot wallets and cold wallets.
- Hot wallets: Connected to the internet and used for daily transactions.
 - Example: Coinbase Wallet.
- Cold wallets: Offline and used for storing assets securely.
 - Example: Ledger Nano S.

Blockchain Wallet Types

- Desktop wallets - Can be downloaded to a laptop or PC. These wallets work even when not connected to the net.
 - Example - Armory, Multibit, and mSigna
- Mobile wallets - Compatible mobile wallets available. Offers portability QR code compatibility
 - Example - Mycelium
- Cold wallets/ Hot wallets - Cold wallets are 'offline' and very secure, used for large Bitcoin holdings. Hot wallets are 'online' and can be used only when net access is present.
- Online web wallets - Maintained on the cloud by third parties, require internet connectivity to work.
 - Examples - Coinbase, Bitgo, and Coinkite
- Paper wallets - Store the private key and public address in QR form. Though it's a safe, are often prone to humidity and fire hazards.
- Hardware wallets - Resemble a tinier version of flash drives which are safe and easy to use. These cold storage devices are great for transferring private keys and can withstand hazards, unlike paper wallets.
 - Examples - Trezor and Ledger HW.1
- Bitcoin wallets - Bitcoin wallets were used by the pioneers of the blockchain system. They have access to all transactions in the blockchain ecosystem.

Blockchain Nodes & Its Types

- Nodes are the computers in a blockchain network that store the blockchain data and participate in the validation and verification of transactions.
- Types of nodes: Full nodes, light nodes, and mining nodes.
- Full nodes: Store a complete copy of the blockchain and participate in the validation of transactions.
- Light nodes: Store only a portion of the blockchain and rely on full nodes for validation.
- Mining nodes: Participate in the verification of transactions and the addition of new blocks to the blockchain.
- Nodes are essential to the operation and security of a blockchain network. They ensure the integrity and consistency of the blockchain data.

Blokchain-based Mining

- Mining is the process of verifying transactions and adding new blocks to the blockchain.
- Mining nodes perform the work of verifying

