Features of Blockchain

* **Distributed**

Blockchain is built on Distributed Ledger and due to this the databases shared between all parties in a networks cross geography & regulatory boundary. Information can be quickly accessed by any parties without any manual intervention. All parties are directly connected through a highly transparent, secure, tamper-proof network so, no need for third parties.

* **Immutable**

Blockchain put each transaction in immutable block, and according to this the current state are calculated. once the transaction blocks get added on each ledger, no one can just go back and change it.

* **Enhanced Security**

Due to use of cryptography all data are stored hashed. All input data goes through a mathematical algorithm that produces hash ID. All the blocks in the ledger have its own unique hash and the hash ID of the previous block. So, changing or trying to tamper with the data will mean changing all the hash IDs. And that’s kind of impossible.

* **Consensus**

There is no central authority present to validate and verify the transactions but through consensus protocol all the peers of the Blockchain network reach a common agreement about the present state. Thus, consensus algorithms achieve reliability in the network and establish trust between unknown parties.

### **Faster Settlement**

Blockchain provide peer to peer transaction removing the requirement of third parties. Traditionally huge amount of communication and paperwork required between parties to validate the transactions manually. With smart contract those rules can be programmable, and businesses can automatically validate, sign, and enforce agreements. This feature makes the transaction fast and cheap.

* **Transparency**

With traditional system, centralized authority only has the authority over the data and they are the sole provider of Trust. But with blockchain, data are secured and immutable with hash. This provides distributed access authority of data to the peers of the network and brings more transparency into system.

**Blockchain ecosystem**

* **Nodes**

Communication agents through which each parties are connected through the network.

* **Assets**

Anything that is capable of being owned or controlled to produce value, is considered an asset

* **Transaction**

smallest building block of a blockchain system that signifies an asset transfer between two or more participants.

* **Block**

Data structure to combine multiple transactions and encrypting by hash.

* **Chain**

Sequential chain of blocks. Each block in the chain has its own hash ID and its previous blocks hash ID to maintain the sequential continuity of the transaction.

* **Smart Contract**

Set of conditions under which transactions occur. Shared between all peers of the network and each party executes the rules to verify the validity of the transaction and achieve the consensus in the system.

* **Certificate Authorities**

Entity in the network that manage identity and permission of the peers.

**Blockchain Mechanism**

1. Transaction Requested
2. Transaction is added to a block
3. Block is propagated through the network to each node of the network
4. Nodes validate the block and attach proof-of-work
5. Block is added to the blockchain
6. Transaction completed

Types of Blockchain

### **Public Blockchain**

Non-restrictive, permission-less distributed ledger system where anyone can join and do transactions. Verification of the transactions is done through consensus algorithm.

#### **Private Blockchain**

closed network that is under the control of an entity. Each node can have different set accessibility, authorization. Lack of decentralized nature as centralized nodes make the last call.

#### **Consortium Blockchain**

some aspects of the organizations are made public, while others remain private. managed by more than one organization so holds a decentralized nature.

### **Hybrid Blockchain**

combination of the private and public blockchain.  users can control who gets access to which data stored in the blockchain. Only a selected section of data or records from the blockchain can be allowed to go public keeping the rest as confidential in the private network.