BLOCKCHAIN EXPLAINER

Ledger

#LEDGER #BITCOIN #DISTRIBUTEDLEDGER #BLOCKCHAIN

A ledger in its simplest terms is a record for bookkeeping, most commonly for assets such as money and property. A distributed ledger is the type of ledger associated with blockchain technology.

What It Is:

A **distributed ledger** is essentially an asset database that can be shared across a network of multiple sites, geographies, or institutions. Some features of a distributed ledger include:

- All network participants own an identical copy of the ledger
- Changes to the ledger are reflected in all copies within minutes
- Assets recorded may be financial, legal, physical, or electronic
- Security and accuracy are maintained cryptographically through the use of “keys” and signatures to control use of the ledger
- Entries may be updated by one, some, or all participants, depending on the rules agreed upon by the network
- Extremely robust and difficult to cyberattack
- Have even more uses when paired with smart contracts or other applications

The Great Debate:

Distributed Ledger	Centralized Database
Consensus on data	Internal/external reconciliation required
Append-only (immutable)	No restrictions
Distributed	Single point of failure
Decentralized	Single point of control
Peer-to-peer	Many gateways and middlemen
Cryptographic verification	Cryptography must be added after
Cryptographic authentication and authorization	Actions are completed on behalf of others
Resiliency increases with node count	Backups must be set up manually

Types of Ledgers:.

Public or “Unpermissioned” ledgers

A public or unpermissioned ledger has no single owner and cannot be owned. These ledgers allow anyone to contribute data to the ledger and everyone in possession of the ledger has identical copies. No actor can prevent a transaction from being added to the ledger, so integrity is maintained by reaching a consensus about its state. Can be used as an non-editable, global record. However, these ledgers pose a threat to institutional power structures and may invoke a regulatory response. Ethereum is an example of a public or “unpermissioned” ledger, because any participant may write code on Ethereum.

ethereum

Private or “Permissioned” ledgers

A private or “permissioned” ledger may have one or many owners. The ledger maintains its integrity via a limited consensus process, carried out by trusted actors, e.g. government departments or banks. This makes for easier maintenance of the ledger than an unpermissioned one. This consensus mechanism leads to a high degree of confidence in the validity and security of the records. These ledgers are typically faster than an unpermissioned ledger. Many consortia, such as the R3 CEV, are considered private ledgers, because they are limited to certain parties.

Sources: https://en.wikipedia.org/wiki/Distributed_ledgerhttps://en.bitcoin.it/wiki/Main_Page
http://www.everledger.io/
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf