

What Is Distributed Ledger Technology (DLT)?

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Blockchain and DLT are often used to mean the same thing — but all DLT is not blockchain. What is distributed ledger technology?

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A distributed ledger, also known as a shared ledger, is a database that is consensually shared across multiple sites and geographies on a [peer-to-peer \(P2P\)](#) network without the need for a central authority. Each participant becomes a public witness of the transactions or data recorded on the distributed ledger. All the participants own an identical copy of the data on the shared network, making it nearly impossible for a single entity to make changes to the database.

A distributed ledger is very different from a centralized ledger, which is widely used by many institutions. A centralized ledger is highly prone to cyberattacks, because it has one point of failure. On the other hand, a distributed ledger is decentralized, meaning that the need for third-party intermediaries is removed and security is enhanced.

Blockchain vs Distributed Ledger Technology

Distributed ledger technologies (DLT) require a peer-to-peer network and so-called consensus algorithms to ensure that data is replicated across all nodes. There are various forms of distributed ledgers, with [blockchain](#) — which is popular with mainstream users due to its association with Bitcoin and [cryptocurrencies](#) — being one of them.

While all blockchains are distributed ledgers, not all distributed ledgers are blockchains.

Still, the term “blockchain” is often interchangeably used with “distributed ledger.” This is not correct.

A distributed ledger is simply a type of duplicated and synchronized database shared across different regions, servers and users, without the need for a certain data structure or centralized confirmation.

The various servers communicate with each other to keep the most updated records of transactions. The DLT builder can control the structure, privacy and functionality of the distributed ledger, making it theoretically not that

decentralized at all.

Meanwhile, blockchain technology creates a specific type of distributed ledger that usually establishes an immutable database shared by a decentralized network, using cryptography to validate and record all actions through a [consensus](#) mechanism. Each block of transactions is cryptographically linked to its validated predecessor to create a chain of uninterrupted, time-stamped data records.

Especially in the case of cryptocurrencies, these records are accessible by the public and its rules are determined by its community based on their contributions through either computational [mining](#) power or asset [staking](#). Enterprise blockchains on the other hand — as built on the technology of [Hyperledger](#) Fabric, [R3](#), [Corda](#), [Ripple](#) and [Ethereum](#) — allow for privacy and scaling settings as required by its creators.

A major difference between blockchain and distributed ledgers is that blockchain must achieve consensus across its nodes, while a distributed ledger can achieve this without network-wide validation.

Types of Distributed Ledger Technologies

There are two distinct types of distributed ledgers and blockchains: permissioned (private) and [permissionless](#) (public). In essence, this determines who can participate in validating transactions on the network.

In a permissionless distributed ledger, anyone can join the network without needing to be approved by anyone, like in the case of [Bitcoin](#) or [Litecoin](#). A permissioned ledger requires participants to be approved before they can be

part of the network, for example Facebook's [Diem stablecoin](#) project (formerly known as Libra).

Advantages of distributed ledgers

- **Security and transparency** - distributed ledger technology allows entries to be made on a decentralized ledger without involving a third-party. The entered records cannot be altered unless an entity controls more than half of the network's computing power. In essence, distributed ledgers are tamper-proof, secure, immutable and transparent.
- **No intermediaries needed** - distributed ledgers greatly reduce operational inefficiencies. The elimination of third-parties saves both time and money. Such ledgers are good for financial transactions, as they offer a better alternative to the traditional banking process, known for being bureaucratic, expensive and time-consuming.
- **Secure** - distributed ledgers boost high security due to their decentralized nature. The information entered on the ledger is not stored on a single location, but rather, on all the computers (nodes) participating in maintaining the network.

Use of Distributed Ledgers

Distributed ledgers have shown that they have what it takes to be used by private corporations, governments and institutions. Governments can [utilize](#) decentralized ledgers to minimize fraud, data security and streamline processes. The technology can be used in several industries such as:

- Finance
- Education
- Supply chains
- Mining industry
- Farming and agriculture
- Music and entertainment

The Future of DLT

The extent to which distributed ledger technologies such as blockchain will revolutionize both the public and private sectors is still up for debate, with

questions remaining about whether these technologies can be sufficiently used on a wide scale. Detractors have claimed in the past that the technology is akin to a hammer looking for a nail, because it has no specific use case.

However, with the digital transformation of the world economy and a new era of [central bank digital currencies](#) (CBDC), China's Blockchain Services Network (BSN) and enterprise currencies like JPMorgan's JPM Coin now becoming a reality, a future dictated by blockchain-powered DLT is becoming a near-certainty.