

# **Blockchain And Distributed Ledgers**

*Technology And Real-World  
Applications*

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## **Chapter 1 – What Are The Similarities And Differences Between Blockchain And Distributed Ledgers?**

Do blockchain technology and distributed ledger technology share the same characteristics? Not necessarily. Several misconceptions exist regarding this topic. In this chapter, we examine how distributed ledger technology differs from and is similar to blockchain technology. Digital technology has ushered in an era of sound bites and buzzwords.

In an age where even complex technological solutions can be summarized in five words or less. As a result, we are seeing an increase in businesses trying to capitalize on the so-called crypto boom.

With the rise of Bitcoin and other cryptocurrencies, blockchain has been in the news almost daily. Distributed ledgers, however, have not received the same amount of attention. People often have more questions than answers when they hear the words distributed ledger technology and blockchain in the same sentence.

All of this is before Bitcoin is introduced and it will be explained to you as you read on. Blockchain technology and distributed ledger technology are often used interchangeably. This is understandable considering many people think in such a manner. Having scratched beneath the surface, it is time to understand what lies beneath the buzzwords.

Despite the fact that the two terms have become synonymous over the past few years, it is important to distinguish them. How Does A Distributed Ledger Work? Despite the confusion created by acronyms such as DLT in financial and Fintech circles, it should be noted that this technology is comparatively straightforward. The term distributed ledger refers to a database that resides in multiple locations or is

shared by multiple participants. On the other hand, most companies currently employ a centralized database that resides at a fixed location. This type of configuration is essentially vulnerable to failure.

The decentralized nature of a distributed ledger eliminates the need for a central authority or intermediary to process, validate, or authenticate transactions. Distributed ledger technology is used by companies to process, validate or authenticate transactions or other types of data exchange. Typically, these records are only recorded in the ledger after the parties involved have reached a consensus.

After the distributed ledger has been created, all files are timestamped and given unique cryptographic signatures. All participants on the distributed ledger are able to see all of the records in question. By using the technology, an auditable and verifiable history of all information on a dataset can be generated.

What is blockchain technology? Think of blockchain and distributed ledger as you would Kleenex and facial tissues. The former is a type of the latter, but it has become so popular that it has become ingrained in the minds of the public as to what the product is.

Blockchains are essentially shared databases filled with entries that must be verified and encrypted. An easy way to understand it is to consider it as an Office 365 document that is highly secure and verified. Document entries are linked to their predecessors logically. Blockchain refers to the “blocks” of information that are added to the chain of transaction records. This is accomplished through the use of cryptographic signatures, or hashes.

What Are the Differences Between Blockchain and Distributed Ledger? The most important distinction is that blockchain is one type of distributed ledger. Despite the fact that blockchains are composed of blocks, distributed ledgers do not require a chain of blocks to function. Additionally, distributed ledger systems do not require proof of work and provide - theoretically - better scalability options.

Distributed ledger technology is appealing due to its ability to remove the intermediary from the equation. In contrast to blockchain, a distributed ledger does not necessarily require a data structure in the form of blocks. Distributed ledgers are simply types of databases that are spread across multiple locations, regions, or participants.

It is likely that you think of a distributed ledger as being similar to a blockchain. All blockchains, however, are distributed ledgers, but not all distributed ledgers are blockchains. Blockchains represent merely a subset of distributed ledgers in addition to being a kind of distributed ledger.

The advantages of blockchain technology and distributed ledger technology. A distributed ledger gives users control over all the information and transactions contained within it and promotes transparency. Businesses will save billions of dollars by reducing transaction times to mere minutes and processing transactions 24/7. Technology will also facilitate improved back-office efficiency and automation.

Blockchains are extremely useful for financial transactions. As a result, operational inefficiencies are reduced (which ultimately results in cost savings). Due to the decentralized nature of the ledgers, as well as the fact that they are immutable, they also provide greater security. Alternatively, blockchain technology provides a method for creating a

tamper-proof record of sensitive activity that is both secure and efficient.

From international funds transfers to shareholder records, this encompasses a wide range of information. The financial processing process is radically upgraded in order to offer companies a secure, digital alternative to processes conducted by clearinghouses. As a result, we are able to avoid these time-consuming, expensive, and bureaucratic processes. The data that is written to a blockchain becomes part of the network.

The audit trail becomes accurate and immutable when a series of transactions occur over time. Financial audits are extremely beneficial in this regard. The data is stored in a place where no single entity owns or controls it, and where no one can change what's already been written, providing benefits similar to double-entry bookkeeping. This ultimately results in fewer chances of fraud or errors.

In summary, blockchain refers to a particular type of distributed ledger. Businesses may use this system to record transactions or digital interactions in order to improve transparency, efficiency, and security. Blockchain is only the tip of the proverbial iceberg when it comes to these two technologies. Next time you hear a sales pitch that begins with the phrase 'blockchain is the future,' perhaps you should consider distributed ledger technology. By doing so, you may be able to determine just how well the self-proclaimed expert or sales representative understands his or her subject.

## **Chapter 2 – How Bitcoin Utilizes Distributed Ledger Technology**

Distributed ledger technology and Bitcoin were the forerunners of the cryptocurrency market. Bitcoin is based on the blockchain technology, which will result in a revolution in the currency market. Invented in 2008, bitcoin uses the same technology.

Let's take a closer look at distributed ledgers. Distributed ledgers are databases that are shared across a network and accessible from different locations. They are stored, reorganized, and controlled by nodes, or individual computers. A distributed ledger eliminates the need for a third party. As distributed ledgers are inherently decentralized and provide a high level of visibility, they are considered highly secure.

An overview of distributed ledger technology for Bitcoin. Individual nodes are responsible for holding, reorganizing, and controlling distributed ledgers. Distributed ledger databases are constructed independently by each node. Each node processes every transaction occurring on the network, and a conclusion about the development of the database is created. Based on the transactions, the database is voted on after the changes are completed. In the voting process, all nodes participate, and if at least 51% of them agree, the new transaction is accepted by the database. The nodes then update the version of the database in order to ensure that all of the devices or nodes are using the same version. A block is then added to the blockchain to indicate the entry of the new transaction.

How Bitcoin uses distributed technology to make it secure. It is possible to maintain a growing list of records through blockchain networking. Cryptocurrency security is provided by blockchain authentication. Nodes in a Proof-of-Work blockchain, also known as miners, ensure the integrity of the network. The miner who successfully inserts a new transaction into a block receives a reward. This activity requires a substantial amount of computer processing power. Cryptographic hashes for new blocks are computed by miners. The miner who finds the hash first, among the miners, will receive the reward. Miners who devote more computational power to finding the hash are more likely to succeed.

However, as more and more blocks are generated, it becomes more difficult to find subsequent hash rates. It is important that the frequency of generating blocks remain constant.

Advantages of Distributed Ledgers For Bitcoin

**1. Highly transparent, secure, immutable, and tamper-proof.** In distributed ledgers, the entries are made directly in the database without the involvement of a third party. A record that has been entered into a distributed ledger cannot be altered by any other party. As a result, the ledgers cannot be altered until they have been distributed.

**2. There is no need for a third party.** However, it is not always necessary to use distributed ledgers without a third party, but in some cases, it can save a great deal of money and time. In the supply chain, the entire system of producing and delivering a product or service, from the very beginning stage of sourcing the raw materials to the final business, results can be written directly by sensors to the blockchain



without the need for a third party. This saves considerable amounts of money, effort, and time.

**3. Increasing security due to their inherent decentralization.** The distributed ledgers' inherent decentralization adds an additional layer of security. The distributed database is difficult to hack as it is distributed globally.

**4. Providing high levels of transparency.** Distributed ledgers are highly transparent. They enable all the stored information to be freely accessed. This provides a significant amount of transparency that is desired by a number of sectors.

Distributed ledgers, such as Bitcoin, are widely used. It is a virtual currency that, when used as payment on a network, allows users to make non-reversible payments for a fee that is lower than that charged by conventional online payment methods.

A growing number of cryptocurrencies are competing with Bitcoin, including Ethereum. As Bitcoin (BTC) has risen in popularity, the cryptocurrency market has been validated. Distributed ledger technology is a popular method of creating applications for the development of distributed ledgers. Distributed ledger technology introduced smart contracts, which are becoming increasingly popular. Self-executing smart contracts are triggered by the fulfillment of certain predetermined, real-world conditions, and related data is entered into the blockchain. A distributed ledger such as Ripple is another example of a distributed ledger that is an open-source ledger focusing on payments, particularly cross-border transactions. Ripple was originally intended for banks. At the next chapter, we will discuss smart contracts, ripple,

and distributed ledgers in more detail. Kindly read on. Thank  
You.

## **Chapter 3 – What Are Smart Contracts?**

In what ways do smart contracts differ from traditional contracts? An intelligent contract is a self-executing contract whose terms are predetermined. The Definitive Purchase Agreement (DPA) is a legal document that documents the terms and conditions between two companies when they enter into an agreement for a merger, acquisition, divestiture, joint venture, or other form of strategic alliance.

The contract's counterparties are embedded in a line of code that serves as a mutually binding contract. Financial Modeling Programming Language. Microsoft Excel remains the dominant language for developing financial models. The CFI's online courses and FMVA program are considered to be the most comprehensive training in Excel modeling. In essence, a smart contract which is different from Excel is a digital version of the traditional paper contract that automatically verifies and enforces the contract's terms and conditions.

Nick Szabo, an American computer scientist and researcher of digital currencies, developed the concept of smart contracts in 1994. The smart contract is executed through a blockchain network, and the code of the contract is replicated on several computers that comprise the network.

The result is an increased degree of transparency and enhanced security regarding the facilitation and execution of contractual terms. A smart contract does not require a middleman. A financial intermediary is an institution that acts as a middleman between two parties in order to facilitate a financial transaction. Among the types of institutions commonly referred to as financial intermediaries are commercial banks, investment banks, mutual funds, and

pension funds. The code of a smart contract is verified by all participants in the blockchain network before it is executed. The elimination of the middleman from the contract allows counterparties to substantially reduce their costs.