

# A Review on Blockchain Technology and Blockchain Projects

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## **Abstract**

Blockchain is the technology that can lead to significant changes in our business environment and will have great impact on the next few decades. It can change the way we perceive business processes, and can transform our economy. Blockchain is a decentralized and distributed ledger technology that aims to ensure transparency, data security and integrity, since it cannot be tampered or forged. Most of the current research related to Blockchain Technology is focusing on its application for cryptocurrencies, such as Bitcoin and only a limited number of research is targeted at exploring the utilization of Blockchain Technology in other environments or sectors. Blockchain Technology is more than just cryptocurrency, and it can have several applications in government, finance and banking industry, accounting and Business Process Management. Therefore, this paper attempts to investigate and explore its opportunities and challenges for the current or future applications of Blockchain Technology.

## **Keywords :**

Blockchain Technology, Cryptocurrency, Applications, Business, Finance

## **Introduction**

Blockchain technology is a revolutionary computer protocol used for digital recording and storing information on multiple computers or multiple nodes. One of the most important elements of Blockchain is the so-called “Ledger”, which is similar to a relational database Walport . A Blockchain is a list of encrypted digital record or transaction, called a block. Each block is then “chained” to the next block, in a linear, chronological order, using a cryptographic signature . The blocks contain a copy of the last transactions since the last block was added. Thus, the shared block, or ledger, is linked to all participants who use their computers in a network to validate or confirm transactions, removing the need for a third-party. Blockchain is used to secure and distribute data in a new and unique way. The elimination of a central instance in the distributed network implies a radical shift to direct transactions between non-intermediaries or intermediary services. Thus, Blockchain can only be updated by consensus between participants in the system and a transaction can never be altered or deleted. Its distributed database cannot be hacked, manipulated or disrupted in the same way as a traditional, centralized database with a user-controlled access system. In other words, the data is immutable and once it has been written to a Blockchain, nobody, not even a system administrator, can modify or delete it from the ledger. Since, each data block is time stamped and linked in a chronological order via a cryptographic signature Walport. Blockchain Technology can be applied almost in any type of transaction, involving value, such as money, goods, land ownership, medical records or even votes. Blockchain does not require data migration in a project; all relevant transaction data will be

stored on the ledger and status will be then derived from it. Since, Blockchain is a distributed system without a central control point or authority and it is not regulated by a single control center as there might be with a system administration, there's no single point of failure. Hence, in an enterprise, theoretically, there would be no need for an IT professional to monitor security on a blockchain database. Despite these possibilities, it's important to emphasize that Blockchain is a very new technology. As a result, there are only a small number of instances in which the technology has been applied. A proven example, could be the Bitcoins which is the most successful implementation of the Blockchain Technology, and has confirmed to be a viable solution in creating trust in a trust-less ecosystem without central authority. The objective of here is to present a review of the Blockchain Technology and its current or future practical applications.

## The Concept of Blockchain Technology

Blockchain Technology is a continuously growing list of records, called blocks, which are linked and secured using cryptography. Each block typically contains a cryptographic hash code of the previous block, a timestamp and transaction data (Bogart Rice 2015), which as designed so that these transactions are immutable.

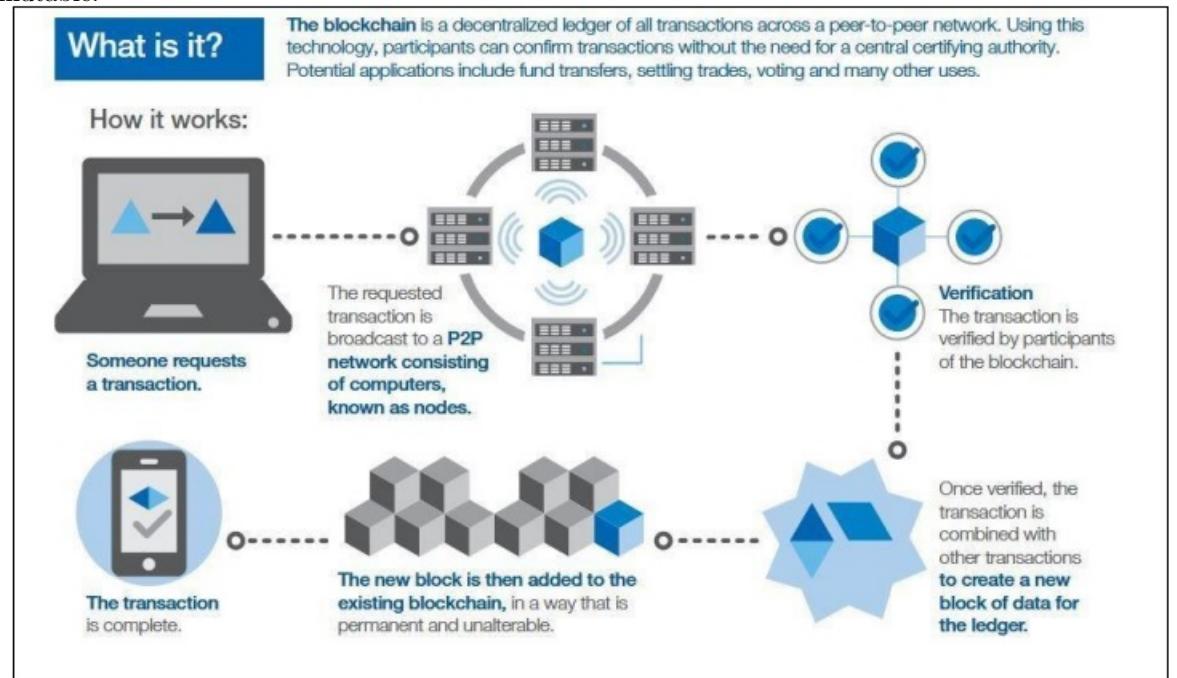


Figure 1: The Concept of Blockchain Technology

The Blockchain concept was devised by Nakamoto (2008) and is displayed in

Figure 2. Blockchain or Distributed Ledger Technology (DLT) is a distributed ledger recording technology (Walport 2016), which contains information about transactions or events. It can record transactions in a transparent, secure, decentralized, efficient, and low-cost way.

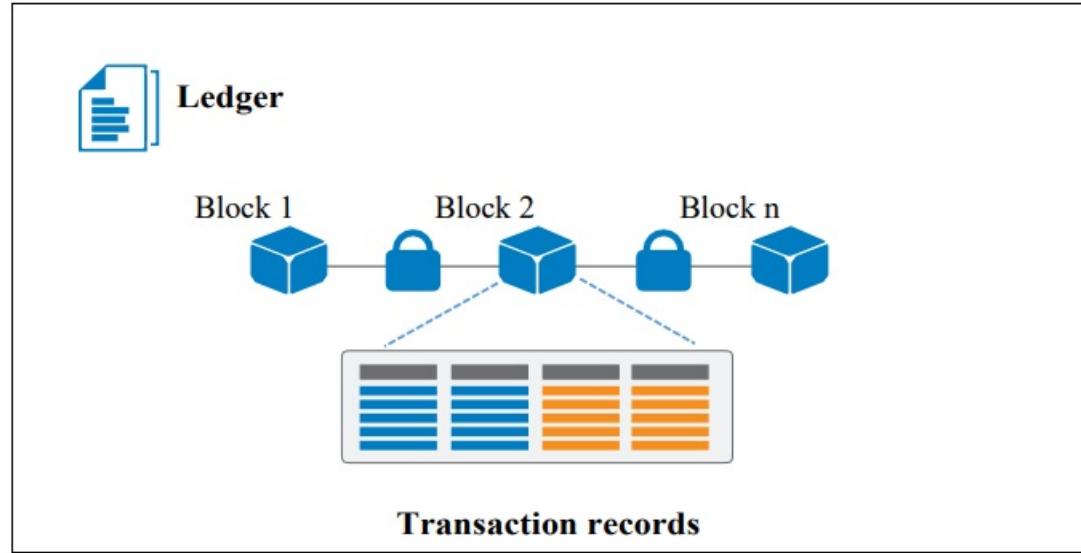


Figure 2: The Concept of Blockchain Technology.

Hence, the Blockchain Technology has the following characteristics: a distributed ledger, decentralized data management, data security, transparency and integrity, anti-tampering and anti-forgery, high efficiency, low cost, programmable features that increase flexibility and reliability and no risk of a centralized database failure.

There are several types of Blockchains, some of the most important are: Public Blockchain, Private Blockchain and Consortium Blockchain (hybrid Blockchain). Each type has its advantages and disadvantages, allowing them to meet the needs of various applications (He et al., 2016; Buterin (2015)). Figure 3 illustrates the Types of Blockchain Technology. Specifically, using a) Public Blockchain, anyone can transact on the network transactions which are transparent and are anonymous. A Public Blockchain, such as bitcoin, is completely decentralized. The system operates based on users' consensus; there is no central point of failure. However, Public Blockchain is vulnerable to system attacks. For instance, an attacker could recreate and properly chain all the blocks that had been modified, without being detected by the participants; b) Private Blockchain, the transactions are secret, the data is not available for public view, but the members are known. In a private Blockchain network, a participant cannot read or write the Blockchain unless the participant has a permission or an invitation to join the network. Private Blockchain is usually used by large companies with permissions defined between various stakeholders of the enterprise Blockchain. For instance, a bank can have its own Blockchain network for its private use with restricted access to its various stakeholders such as customers, employees

and suppliers; c) Consortium Blockchain is a hybrid model of both Public and Private Blockchain. Choosing this model, enterprises or institutions can have their own Private Blockchain network to share the data among the consortium participants (such as banks, institutions and other enterprises or firms).