



The Future of Blockchain Technology

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Abstract

Blockchain technology is a subset of distributed ledger technology that is rapidly expanding, with the potential to occupy a significant portion of the technology market.

Keywords: Blockchain Technology; Cryptocurrency; Bitcoin

What is Blockchain?

A non-centralized data storage or ledger shared by the components of a computer network is known as a blockchain. The Blockchain serves as a digital database for the electronic archiving of data. The vital role that blockchains serve in cryptocurrency systems like Bitcoin for preserving a secure and decentralized record of transactions is what makes it the most well-known [1].

Most people mistakenly think that Bitcoin and blockchain are the same thing since Bitcoin, NFTs (Non-fungible tokens), and Ethereum are the most well-known examples of blockchain. That is not the case, though, as one is the technology that underlies most apps, including cryptocurrency. There are four unique categories of blockchain systems: Private, Public, Consortium, and Hybrid.

Public blockchain

Blockchains are highly compatible with the concept of decentralization and anyone with a compatible device can connect and join the network, there are no limitations.

- This blockchain category is accessible to everyone with compatible devices and internet access, which implies it is not controlled by anybody.
- Each system in the body of the network has a duplicate of any other nodes or network blocks that are available.

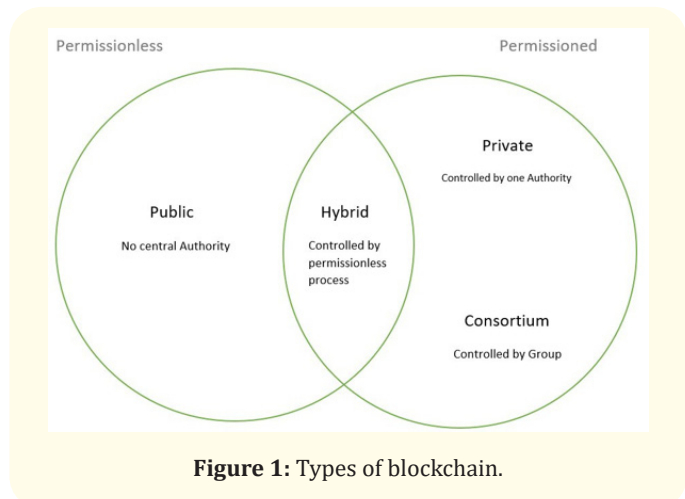


Figure 1: Types of blockchain.

- We can also carry out transaction or record verification in this open blockchain.

Examples of open blockchains are Ethereum and Bitcoin.

Private blockchain

Public blockchains are more secure than other types of blockchains because they are more decentralized, with only a small number of nodes able to participate in the private blockchain process. These blockchains are not as decentralized as public blockchains.

- In regards to public blockchains, these are not as transparent and only certain authorized users have access to them.
- These blockchains run on a private network.
- In this, only a select few individuals are permitted to join a network within a business or organization.

Examples are: Corda, Hyperledger.

Hybrid blockchain

This involves a blend of private and public blockchain data, where some parts are under the responsibility of a single company and others are openly accessible.

- It involves both public and private..
- All systems permissions are employed.
- Smart contracts permits users to get data
- A primary entity cannot change a transaction even if it owns a hybrid blockchain.

Examples are the XRP token and Ripple network.

Consortium blockchain

It is a unique pattern that meets the company's needs. The transaction is confirmed by this blockchain, which also sends or receives transactions.

- Likewise referred to as Federated Blockchain.
- This is a novel approach to meeting the organization's needs.
- There are both public and private areas.
- In this structure, the blockchain is managed by various different organizations. Examples are Multichain and Tendermint [2].

How blockchain works

Blockchain references its name to the way it keeps transaction information—in blocks connected by links to structure a long chain. The blockchain expands as more transactions are made. The moment and structure of transactions are kept, recorded and validated in blocks, which are usually added to the blockchain and governed by the rules established by the network's participants. A hash, also known as a digital fingerprint or a one-of-a-kind identification, together with the hash of the previous block are all inside in each block. A block-chain cannot be altered or put in-between two present blocks because of the previous block hash, which connects the blocks. The procedure makes the blockchain immune to tampering.

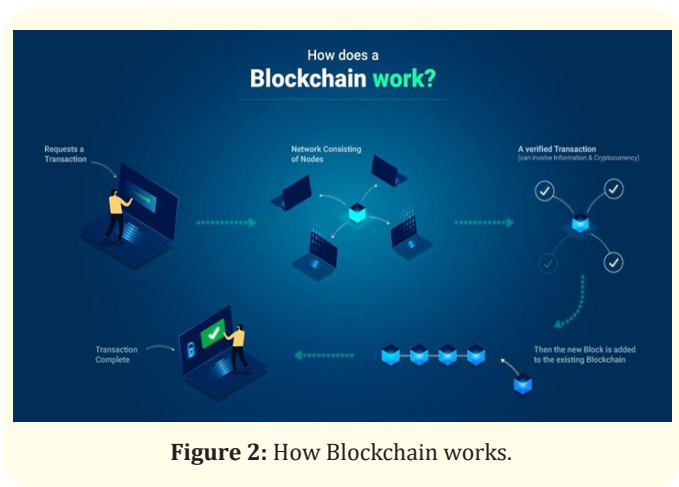


Figure 2: How Blockchain works.

The 4 major ideology behind blockchain are:

- **Smart contracts:** A smart digital contract is “a set of instructions that govern a business transaction; it’s kept on the blockchain and is activated automatically as part of a transaction”.
- **Authorization:** Authorization ensure that transactions are well secure, authenticated, and verifiable. “With the power to restrict network collaboration, organizations can more easily follow suit with data protection rules, such as those written in the General Data Protection Regulation (GDPR)” and the Health Insurance Portability and Accountability Act (HIPAA)).
- **Distributed ledger:** A distributed ledger is an “add-only” shared system of records shared across a business network. “With a distributed ledger, transactions are recorded only once, eliminating the duplication of effort that’s typical of traditional business networks.”
- **Consensus:** Through consensus, all parties decide to agree to the network-verified transaction. Blockchains have different consensus systems, including multi signature, proof of stake and PBFT (practical Byzantine fault tolerance).

Each blockchain system has different participants who play these characters, among others:

- **Regulators:** Blockchain users with special access to oversee the transactions happening within the system.
- **Blockchain users:** Business operators with access to join the blockchain system and conduct transactions with other network participants.

- **Blockchain network operators:** Individuals who have special permissions and authority to define, create, manage, and monitor the blockchain system.
- **Certificate authorities:** Individuals who grant and manage the different types of certificates are needed to run an authorized blockchain [3].

The evolution/development of blockchain for further explanations will be broken down into three phases, each of which has a certain number of years.

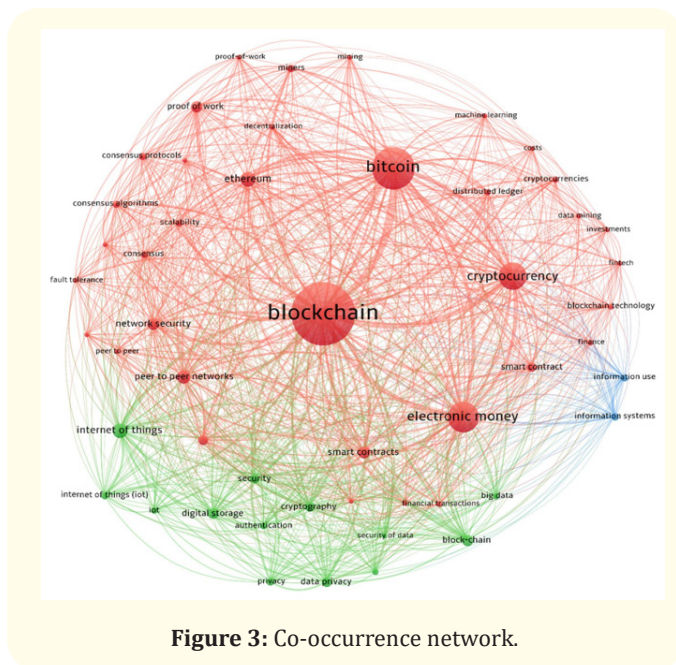


Figure 3: Co-occurrence network.

Ancient (2008-2013)
The emergence of bitcoin

The first blockchain-based application ever made was Bitcoin (BTC). It was initially developed in 2009, and it is still the most widely used and expensive digital money.

It was explained in details as a digital peer-to-peer system by Satoshi Nakamoto in his whitepaper. One of the longest chains of blocks carrying various kinds of data and transactions was created by Nakamoto by creating the genesis block, from which further blocks were mined.

Numerous applications have emerged since the advent of Bitcoin, a blockchain application, all of which aim to take advantage of the capabilities and guiding principles of digital ledger technology. As a result, there is a vast number of applications for blockchain that have emerged during the course of technical development [4].

Middle (2013-2015)
Ethereum development (THE BITCOIN 2.0)

“Infinite increase of material consumption in a finite planet is an impossibility”, as E. F. Schumacher once put it. As a result, Vitalik Buterin began developing what he believed to be a changeable blockchain that can serve a variety of purposes in addition to serving as a peer-to-peer network. Buterin believed that Bitcoin could be more and that it hasn’t done justice to the capabilities of blockchain. A crucial turning point in the history of the blockchain came when Ethereum was introduced as a brand-new public blockchain in 2013 with more features than Bitcoin.

By introducing a feature that enables individuals to record other assets in addition to contracts, such as slogans, Buterin created Ethereum apart from the Bitcoin Blockchain. With the addition of the new feature, Ethereum’s capabilities were increased from those of a cryptocurrency to those of a platform for the creation of decentralized apps.

The Ethereum blockchain, which was formally introduced in 2015, has developed into one of the most significant uses of blockchain technology thanks to its capacity to enable smart contracts that can be used for a variety of tasks. The blockchain technology for Ethereum has also been successful in attracting a vibrant developer community, which has helped it build a true ecosystem.

Due to its capacity to handle smart contracts and decentralized apps, the Ethereum blockchain conducts the most daily transactions. The bitcoin market cap of the company has also dramatically increased.

Future (2018-present) the rubbing of minds

Since 2018, several people have developed additional forms of blockchain technology to make up for bitcoin and Ethereum’s flaws since, as we all know, innovation never stops. NEO, explained as the

number one open-source, distributed, and blockchain platform developed in China is one of the latest blockchain systems. The nation continues to be engaged in blockchain technology despite the ban on cryptocurrency. With the support of Jack Ma, the CEO of Alibaba, NEO positions itself as the Chinese Ethereum and aspires to rival Baidu's influence in the nation.

IOTA was created as a result of some engineers leveraging blockchain technology in the race to hasten the development of the Internet of Things. The cryptocurrency platform aims to offer no transaction costs and distinctive verification procedures, and it is tailored for the Internet of Things ecosystem. Additionally, it tackles some of the scaling problems with Blockchain 1.0 Bitcoin.

Other second-generation blockchain systems, in addition to IOTA and NEO, are also making waves in the market. In a bid to address a bit of the security and scalability issues related to the early blockchain systems, the Monero Zcash and Dash blockchains were created. Dubbed privacy Altcoins, the three blockchain applications aim to grant top levels of privacy and security regarding transactions.

The blockchain history previously covered involves open blockchain networks, in which anybody can view a network's contents. However, as technology has improved, many businesses and organizations have started integrating this solution to improve operational effectiveness.

In order to get a head start on the usage of technology, large businesses are making significant investments in employing professionals. When it comes to searching out blockchain technology platforms, organizations like Microsoft appear to have taken the front, leading to what we know today as hybrid, private, and federated blockchains [5-11].

To the future

We can see that blockchain has a bright future and a very large future based on the development of blockchain that I have already highlighted. So, based on my brief examination, here are some predictions for the future of blockchain:

- There will be more employment opportunities in blockchain, and there will be a high demand for blockchain professionals

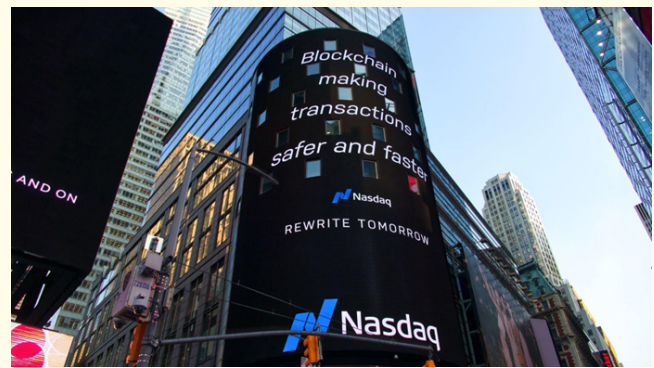


Figure 4

Source: Unsplash, Pascal Bernardon.

- As the technology grows, Gartner Trend Insights expects one business at least to be built on blockchain to allow them valued at over \$10 billion by 2022 and beyond. Based on the Blockchain Digital Transformation research, the research organization predicts the company's value to grow to over \$175.9 billion by 2025 and go over \$3.1 trillion by 2030. So Startups built on blockchain will have a higher net worth.
- Blockchain technology will have more forms of application, bigger than the ones we see in finance, real estate, insurance, and so on.
- There will be higher use of it in finance so companies like Petra would have a higher demand because transactions like money transfers would move to blockchain.
- According to Deloitte, the number of companies using blockchain technology in their operations is expected to exceed 60% by 2020.
- Companies such as Walmart are using blockchain technology to improve and advance their supply chain system.
- Goldman Sachs estimates that the technology could account for as much as \$300 billion of global GDP by 2027.
- JP Morgan is developing a blockchain-based securities settlement platform in partnership with Stellar.org.
- Major banks such as Citigroup, JPMorgan and Wells Fargo are all exploring ways to use blockchain technology in their operations.

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