Everything You Need to Know About Blockchain Development



All rights reserved © 2000-2021 SCAND Ltd.

Blockchain technology first appeared in 2009 as a cryptocurrency platform and within a year it became a viral sensation. The most authoritative media business influencers predicted a great disruptive potential of Blockchain for financial and banking systems.

By the end of December 2020, Bitcoin has reached over 63 million wallet users. With all that, only some banks and financial institutions accept virtual currency today. However, their number is steadily growing as well as the number of businesses that create their own cryptocurrencies. As for the Blockchain, it has evolved into a standalone technology that went beyond the borders of cryptocurrencies.

Nowadays, many companies are incorporating Blockchain into their workflow, making their business even more stable, efficient, better protected, and lucrative. In this article, we cover all you need to know about blockchain technology and how to implement it successfully into your business.

What is Blockchain?

Blockchain represents a shared, transparent, decentralized, replicated, and immutable ledger that helps to record transactions and track assets in a business network.

This Blockchain technology definition may be quite confusing, therefore, let's break it down.

Simply put, Blockchain is a ledger that documents each transaction conducted by the Blockchain participants also known as nodes. This ledger has a set of specific qualities, it is:

• Shared. It means that each Blockchain node receives and stores a copy with complete information on all the transactions performed;

• **Transparent**. It implies that more participants can join Blockchain any time and view all the data in the network. Being transparent Blockchain allows its participants to stay anonymous as it records a wallet address in the ledger but not the identity of the owner;

• **Decentralized**. It signifies that there is no head administrator that decides whether a transaction can or can't be performed. Instead, Blockchain nodes decide if to conduct the transaction. Once it receives 51% of votes the transaction becomes approved. Moreover, if any participant decides to withdraw from the network, the Blockchain will continue to operate;

• **Replicated**. It means that all the new data is updated and synchronized with all the nodes automatically;

• Immutable. It implies that the data on the conducted and documented transactions can't be changed or deleted.

How Blockchain Works



1.New transactions are broadcast to all nodes.



2.Each node collects new transactions into a block.



 Each node works on finding a difficult proof-of-work for its block.



4.When a node finds a proof-of-work, it broadcasts the block to all nodes.



5.Nodes accept the block only if transactions in it are valid and not already spent.



6.Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepting block as the previous hash.

A Blockchain consists of blocks that are linked in a chain. Each block of this chain collects transactions. Each transaction contains some data, including the address of the sender, what was paid, and the address of the receiver.

Here are the steps to perform a transaction in a Blockchain:

1. A participant requests a transaction. It can be a cryptocurrency exchange, data exchange, or initiation of a smart contract.

2. The requested transaction is sent into a network of nodes called a P2P network.

3. The nodes should validate the transaction and its user's status. Once 51% of nodes agree to complete the transaction, it's considered validated.

4. The transaction gets into the latest block and after added to the Blockchain.

Blocks stockpile transactions for some period of time until it fills up. Once the block is full, it gets stamped into the Blockchain with all the data on each transaction recorded in it.

All the blocks in a Blockchain are linked to each other with hashes. **Hash** is a unique code that defines the content of each block. When a block is generated it includes its own hash and the hash of the previous block.



Hashes are important as they prevent any changes in a block. If any dishonest user decides to change any data in a block, this block will change its hash and won't fit in the Blockchain anymore. The concept of joining blocks with unique hashes makes Blockchain a super-secure technology with a high level of data protection.

Another concept that enhances Blockchain security is a proof-of-work. A **proof-of-work** is a mechanism that slows down the creation and adding of new blocks to the Blockchain. It prevents hackers to quickly recalculate and change hashes in a new block. For example, in Bitcoin, it takes almost 10 minutes to add a block to the chain. This way, any changes done to a block will be implemented really slowly.

Although Blockchain is a secure and powerful system, software developers couldn't put it to practical use apart from cryptocurrency exchange. However, with the emergence of Smart Contracts, things started to change.

A **Smart Contract** represents a self-executing program that works once an agreement between a buyer and a seller has been reached. For example, after a company provides a service, a smart contract works, and the company receives the money from its customer.

An agreement between a seller and a buyer is incorporated into the lines of code and represents an 'if-then statement', e.g. 'If the service is provided, then the money is sent to the company'.

Smart Contracts made it possible to apply Blockchain in various industries and perform secure data and service exchange.

What's Wrong with the Way We Store Information Now?

To understand the problem of data storing, let's abstract from Blockchain insides and imagine that it's a word processing document.

The traditional data storing works like a Word document. If you want to work on a file with your colleagues, you need to get through the following steps:

- 1. Work on a document;
- 2. Sent the document to your co-worker;
- 3. Wait until your colleague returns the copy to check the changes.



These procedures are rather time-consuming as you can't edit the copy before your co-worker at the other end finishes with it. That's how many banks work right now. To perform money transfers and maintain money balances, banks lock the access to make a transfer and after the other end updates it, they open the access to the data again.

Blockchain technology can speed this process up many times. It works like Google Docs when the access is shared with many users and they can amend the document simultaneously. This way, Blockchain allows many participants to work on one business document without losing the track of versions as their data is updated and synchronized accordingly.

Today, we store our data mainly in electronic form. Large businesses and small companies keep their data online in the cloud or on private servers. Data breaches can happen any time and then loads of sensitive information can flow into the hands of hackers. Blockchain is the technology designed to protect computer systems from computing power attacks and minimize the chances of serious data leaks.

The Three Pillars of Blockchain Technology

Blockchain technology relies on the 3 basic components. They represent the fundamental characteristics of a Blockchain. When creating a new Blockchain software developers try to keep the three of them in balance. However, most of the time it's impossible to do and one of them is partly sacrificed to keep the other two.

Scalability defines how well a Blockchain can increase its capacity and perform its operations smoothly. It means that the system should be able to stay stable and maintain a high-performance level while growing in size and increasing the load.

Decentralization means that there is no main node that is responsible for decision making in the system. As a result, Blockchain users are independent while working in collaboration in one Blockchain network.

Another great point of decentralization is that it removes the third party from performing transactions. It means that a network of nodes doesn't require any bank or any other institution's approval to perform a transaction. This way, Blockchain technology reduces the costs of each transaction, while building a high level of trust among the participants.

Security is the most important pillar in Blockchain. The technology must be credible for participants to use it. For example, to ensure transaction and privacy safety Bitcoin uses crypto wallets with a digital address. It allows buying and selling cryptocurrency safely without revealing the crypto wallet users to the Blockchain network.

One more security concept is that no blocks in the Blockchain system can be changed or erased. This ensures that the system really works and is stable, proving its reliability to the participants.

Does Blockchain Development Differ From General Apps?

When software developers create web, mobile, or desktop applications based on Blockchain technology, they build Decentralized applications (dApps).

While front-end Blockchain application development doesn't diverge much from creating general applications, its back-end will have a different structure. Basically, software engineers will use a special type of database which is decentralized, has a peer-to-peer connection, is cryptographically secure, and also may imply Smart Contracts. Therefore, it requires building special back-end architecture.

Software engineers will have to choose a back-end programming language and testing and debugging techniques that would suit the Blockchain development. As a result, Blockchain projects often require more time to develop.

Before starting your Blockchain development project, you need to realize which of the three approaches suit best for building your application:

- Platform development;
- Software development;
- Specialized software development.



Platform development

Building your own business platform is an ambitious project. It means that software engineers will create a platform for others to base their software products upon. For example, the Ethereum platform allows various businesses to build their own dApps based on the platform.

Etherum offers its users its own Internet browser, coding language, and payment system. This network is supported by thousands and thousands of users around the globe and it never goes offline.

Software engineers can build a Blockchain platform from scratch or fork the existing Blockchain platforms. If you want to build a Blockchain platform, you need to have an outstanding idea that will make your platform unique. Above all, you'll have to gather a team of experts that have deep knowledge of Blockchain and expertise in the whole cryptocurrency matter.

Software development

Software development implies the creation of dApps that run on Blockchain platforms such as Bitcoin, Hyperledger Fabric, or Etherum. If your business needs to solve a set of specific problems like data analysis or data aggregation then building a Blockchain application is the right choice for your business project.

Businesses that consider developing their own Blockchain software solutions need to find a professional Blockchain development company with the latest software development tools and relevant expertise.

Specialized software development

The creation of specialized software involves the development of applications, plug-ins or protocols that integrate with Blockchain protocols or dApps. For example, there are a variety of open-source projects that integrate with the Bitcoin platform.

If your business has any specific Blockchain community projects, then you can build your application on top of them and benefit from these block-chain based services.

Looking Forward To The Future Of Blockchain

According to Statista, the global Blockchain market will grow rapidly from \$3 billion in 2020 to \$39.7 billion by 2025.



And, however, the financial sector is still one of the main sources of Blockchain investments, it's expected that the technology will be widely implemented together with the Internet of Things (IoT).

Blockchain will enhance the security and scalability of IoT solutions, making them more robust and stable. This smart blend, also known as Chain of Things (CoT) can offer a wide range of benefits to various industrial, environmental, and humanitarian applications.

Nevertheless, many industries are already implementing Blockchain for their daily needs. For example, Blockchain is used in:

Nevertheless, many industries are already implementing Blockchain for their daily needs. For example, Blockchain is used in:

- Healthcare for secure sensitive medical data transfers between doctors and their patients;
- Media industry for copyright protection;

• **Real estate** for prompt title issuance and suggesting properties that can be purchased for cryptocurrency;

• Logistics and transportation for data protection of cargoes and enhanced shipment management;

• Retail to protect world brands' product safety and ensure that the right products reach the store shelves.

Bottom line

After its striking manifestation in 2009 Blockchain technology was mainly used for the development of cryptocurrency platforms. Yet, software developers kept experimenting with Blockchain, and with the introduction of Smart Contracts, the technology started expanding into other industries.

Now, software developers have a clear vision of how to use Blockchain for data protection in various spheres. More and more companies seek ways to implement the technology in their digital solutions. Experts predict that by 2025 Blockchain will grow to 13 times, reaching \$39.7 billion in just 4 years. Therefore, if you're still considering building your Blockchain app then the right moment is now.

Feel free to contact us and ask any questions: info@scand.com