APPLICATIONS OF BLOCKCHAIN TECHNOLOGY AND ITS RELATIONSHIP WITH DECENTRALIZED SYSTEMS

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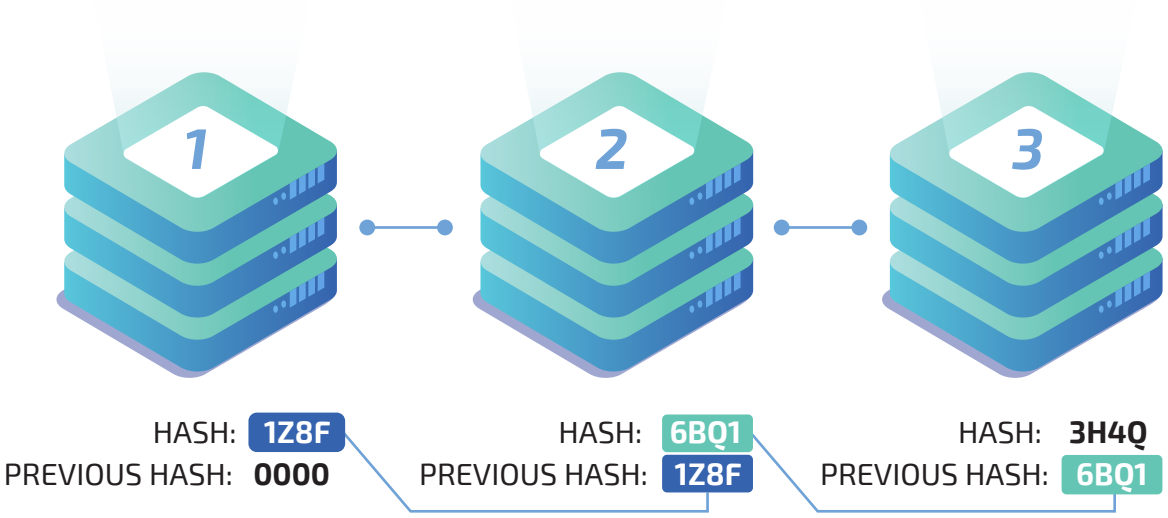
***A Blockchain**, as the name implies, is a chain of blocks that contain information and that are intertwined with each other. The term has become popular thanks to Bitcoin technology, but the truth is that the application of blockchain technology could work for other things like the implementation of digital notaries, the collection of taxes and even the control of medical records.*

How does the blockchain work?

For a blockchain to work there must be blocks with certain specific content: own hash, hash of the previous block and transaction data. That is, if a person A wants to send a transfer to a person B, in the block of that transaction will be the hash of that block, the data of the person A, the amount of the transaction and the data of the person B.

When person B is going to make a new transaction, another block will be generated that will have its own hash as an identifier, but it will also have the hash of the first, that is, the block that was generated when person A made the first transfer. Each hash is unique and could be compared with a fingerprint, this is what makes the use of this technology so safe.



Types of blockchain technology

Perhaps few people know that there is more than one type of blockchain technology, and if there is one, depending on its application and level of privacy, it can be divided into 4 types that are grouped into two main categories: private and public, according to the levels of access to the stored data.

Thus, within each of the categories you can find two types of blockchain, according to their capacity to generate blocks: without permits and with permits, where you can differentiate them by not having restrictions for the generation of new blocks in the chain in the first case, that is, transactions can be carried out without limits where even rewards in digital assets are offered to users who want to stay online.

On the other hand, those with permissions are a little more restricted and in them there are administrators or owners of the network who must give permission to other users to access it and make new transactions within the blockchain. This is the type of technology that is being tested by banks and financial institutions, however it is the least common so far.

What applications can the blockchain technology have?

The blockchain technology allows registering any value that can be expressed digitally: property titles, contracts, birth certificates, votes, financial accounts, etc. all this more quickly, safely and transparently. Its application began being economic, but as new systems based on blockchain are developed, it will mean a great advance at a social and cultural level. Here are some examples:

-Smart contracts, there are several industries that can benefit from this technology, for example in the case of commercial airlines and travel insurance can make smart contracts with the ability to self-execute without intermediaries, for example, if a passenger has a ticket or Airline ticket with reimbursement insurance and finally do not board your flight, you will directly receive the amount agreed in the contract with your insurer because there is a smart contract. This system reduces costs, speeds up the procedure and generates a totally satisfactory user experience.

-Energy industry, the blockchain is expected to become the great ally of the energy industry, since it could make possible the purchase of energy point to point. In the United Kingdom, the Electron company aims to develop the renewable industry with the blockchain to make it more efficient and flexible.

-Recolection of donations and funds in non-governmental organizations, in this case the blockchain can offer non-governmental organizations a more secure and transparent donation system, for example donors could track their donations and know how their contributions are being used.

Decentralized systems and their relation to the blockchain

Distributed financial systems are the current basis of blockchain and cryptocurrency technologies: they are the same users or owners of digital money who exchange their funds among themselves, however to understand what the true advantages of a distributed financial system are, we will first explain in What are the centralized and decentralized financial systems?

What are centralized systems?

A centralized system, as the name implies, is one in which a single person directs, analyzes and makes decisions in the middle of a set (financial or not). It has certain advantages when it does not speak of financial systems, but the fact of delegating all the responsibility to a single person (or a single group) tends to complicate the processes and make them slower, especially when dealing with large volumes of transactions and transactions.

In the case of talking about networks, there would be a very important feature to highlight: the nodes or central information points. In this case, each link of the network that forms would have to communicate with something that would be like a peripheral node that receives and processes part of the information. However, this peripheral node is not the one who makes the final decision. Everything must be communicated to a main (or central) node who will be the one who sends the definitive answer, be it the approval or the denial of a transaction.

An example with which we could better understand a centralized system is a bank. In the banks everything is handled in a main office and although there are different branches to which people go to deposit their money, in the end everything goes to a vault or central account and it is from the main office where they approve or deny transactions. Obviously this happens almost immediately thanks to the use of technology, for which a client of the bank does not have to wait for hours to receive the approval of his transaction but waits for the system to report a response. However, if the system in the main office fails, the rest of the branches could not operate since they would not have where to consult the information.

Decentralized systems: a step beyond centralization

While it is true that centralized systems have some advantages, such as allowing absolute control over everything that happens in the network or in the financial system, they do not turn out to be the most efficient because, depending on only one person, the organization or central node, if it were to fail the entire network could collapse.

In a decentralized network there is an "advance" with respect to the centralized ones. In them there are also peripheral nodes, but these do not require a central node for decision making. That is, there is no longer a need to go through a central node to be able to make transactions or to communicate between nodes. The decision making is divided into peripheral nodes that are able to distribute the information to the rest of the links in the chain and allow communication between them.

To put an easy example of a decentralized system are the franchises: all belong to the same company, follow the same guidelines, there are fundamental things that can't change such as logos or the name of the company, but each of them he manages his own staff and is responsible for managing his income or losses. In this system model, if one of the franchises fails, the safest thing is that it does not affect any of the franchises around it, but it will affect customers who were already used to benefitting from their products or services.

Distributed systems, the passage of the future

Faced with the problems that could be reported with centralized and decentralized systems, a new model emerges: distributed systems. Here there is a noticeable improvement and that there are no nodes, all transactions are p2p, that is, from person to person, without having to go to a third party to operate.

An easy example to understand a distributed system is what in ancient times was called "barter". The financial operations were carried out directly from person to person, without having to go through a third party. If one farmer sowed potatoes, another raised pigs and another planted rice, the one who planted potatoes could exchange them for pork or rice with the other farmers, without having to go through a market where their products were offered and stay with a commission for "Help" them in the exchange process.

This financial system is the current basis of blockchain and cryptocurrency technologies: they are the same users or owners of digital money who exchange their funds among themselves, thus giving a value to the cryptocurrencies that can be represented in fiat money or money tangible.

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