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Applications of Blockchain

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ABSTRACT

The blockchain technology, created in 2009, and since its last years, has made an occupation in the already well-supplied landscape of innovations considered the most promising, alongside the most known technologies such as artificial intelligence and the Internet of Things. However, use of blockchain is growing rapidly. This paper discusses the applications and services of Blockchain and what they can offer. It also covers the challenges and difficulties of implementation of Blockchain applications.

Keywords:- Blockchain, Applications, Artificial intelligence

I. INTRODUCTION

Blockchain [1]is a technology that stores digital data for a minimal cost, in a decentralized and secure way. Blockchain is used to verify the data transactions. The use of this technology extends to all processes in which data must be backed up, authenticated and distributed. Blockchain based applications do not require an intermediate clearing house. Payment transactions, capital market movements, contracts, certifications, certificates, copyrights, patents and registers can therefore be managed, theoretically, without banks, notaries, fiduciaries or state institutions. The growing interest in blockchain technology is therefore not only evident in the banking sector, the real estate, insurance and health sectors could also benefit from Blockchain applications. Supporters also see the potential of the legal system, the energy industry and public administration.

The great feature of the blockchain is the way in which its architecture is independent and decentralized it is not like other technologies hosted by a single server but by some users. There is no intermediary authority so that everyone can check the validity of the chain itself. The information contained in the blocks (transactions, property titles, contracts, etc.) is protected by cryptographic methods that prevent users from modifying them afterwards.

II. SERVICES OF BLOCKCHAIN

Following are the services of Blockchain-

A. A worldwide platform for instant money transfers at very low cost

Currently, the international cash transfer market represents a large number more than [2]300 billion dollars a year. A mere 10% of commissions are collected by several trading platforms around the world.

The blockchain is a much cheaper alternative with just a few cents being taken from each transaction and faster via the exchange of cryptocurrency from a few seconds to 1 hour, against sometimes several days for transfers abroad, convertible into currencies traditional.

The challenge today is to build a simple user experience and win the trust of users.

B. A reliable and transparent method making online voting possible

Blockchain can be used to guarantee the security and transparency of online voting for internal elections. The blockchain with the help of a secured tool can maintain the transparency and can be verified by all and communicated very quickly after the end of the vote.

Neither the voting administrator nor other people can manipulate the votes and this solution is very interesting for countries or political parties facing problems of fraud and difficult vote counting.

C. A way to be compensated automatically in case of delay of his flight

Some services like Etherisc.com are developing blockchain-based automated travel insurance systems. With the help of this service, the passengers can be automatically compensated in case of delay of their flight, without having to fill any form.

The principle: to use "smart contracts", that is to say a set of programs that are autonomous and that allow to automatically run conditions previously defined, written on the blockchain. A connection is established by an algorithm between the "intelligent contract" and the real world with a connection to the databases of the airports. The blockchain in this case creates the confidence to automate the declarative phases without the need for a third party.

D. Technology improving the transparency and efficiency of the music sector

Blockchain could be used to create a global, secure and transparent music copyright database, which is lacking today despite several attempts by industry players. In general, it

could bring transparency to the sometimes-opaque value chain of stakeholders in the music industry.

Another possible use, permitted by smart contracts is the instantaneous payment of copyright to rights holders from the distribution or purchase of a title, under the previously defined conditions (x% for the composer, x% for the performer% for the label).

E. A way to fight against fake drugs

Currently, there is a big problem in the health sector between 10% and 30% of medicines provided in developing countries are "fake drugs", which poses considerable health problems. The World Health Organization estimated that more than 600,000 people die each year from counterfeit drugs.

The presence of blockchain could serve as a universal database guaranteeing several aspects of security such as the traceability and the authenticity of the drugs. This would allow pharmaceutical companies, and even regulators, to use the same base without a single corporation or institution owning it.

III. THE APPLICATIONS OF THE BLOCKCHAIN

The technology of the blockchain is [3] still young but some applications are already operational. One of the most widespread application is the traceability of food. Carrefour is one of the precursors with its QR code affixed to several types of food (chicken, tomato, eggs, etc.) that allows to know everything about the origin of the product (provenance, name of the producer, date of packaging.). Triggering compensation automatically is an application of great interest to insurers. This is made possible via smart contracts, which are self-contained programs that run automatically following pre-defined conditions. Axa allows for example to compensate the passengers of a flight which is late. Finance has also made good progress in the blockchain field, particularly in the area of security tokens, financial securities digitized and recorded on the blockchain. For the token issuer (or token), there are only advantages such as less intermediary, execution and almost immediate regulation and cheaper process. The world of video games has found a use case in the blockchain: digitizing features. In this system of tokens (or tokens), the players really own their objects (and no longer the publisher) and can therefore buy, sell and trade in their guises. There are many others such as securing commercial transactions in trade finance or disintermediation in advertising.

There are 4 major applications of Blockchain discussed below-

A. Application -1- The bitcoin blockchain

Bitcoin is the best-known use case of blockchain which was created in 2008 by an unknown person whose pseudonym is Satoshi Nakamoto. It has been known both by a secure and anonymous payment protocol and a cryptocurrency. This blockchain is public, so open to everyone, the whole world can access it and therefore use bitcoins. To do this, simply create a virtual wallet, downloadable on the app stores.

Cryptocurrency can be used for many purposes, for example, to buy goods of some kind, services and can be traded against other currencies.

Some platforms offer the exchange through the conversion of dollars, euros. Bitcoin has a very volatile price. It can increase as well as decrease or even drop 20% in just two days. This volatility is linked to the strong speculation around this currency and the absence of a regulatory authority. In early December 2017, it increased by more than 1000%. Faced with this surge, the Financial Markets Authority (AMF) and the Prudential Supervisory and Resolution Authority (ACPR) warned investors about the risks associated with to the purchase of bitcoins. In Japan, bitcoin was recognized as a legal means of payment on April 1, 2017. Capitalization of the first cryptocurrency reached $ 191 billion in November 2017.

B. Application -2- The Ethereum blockchain

The Ethereum blockchain has become as popular as the bitcoin. It was created in 2014, Ethereum uses its own cryptocurrency called the ether. Its price is about 600 dollars at the beginning of March 2018 to that of bitcoin, but its capitalization reached more than 60 billion dollars in March 2018.

Comparing with Bitcoin, which allows only simple transactions (mainly payments), Ethereum enables the execution of "smart contracts" that are of interest to players in the banking and insurance sectors, as well as the professions, but also execute autonomous programs that automatically execute actions previously validated by the stakeholders In the future, these players will be able to certify property transfers in a more secure manner or automatically pay compensation. In September 2017, Axa was the first insurer company to purchase blockchain insurance. More importantly it has launched an automated insurance for flight delays based on the blockchain Ethereum, this insurance is a "smart contract" that we talked about, a smart contract that triggers an automatic refund once the delay.

Several companies are aiming to launch an initiative to develop a chain block trading platform. it is known by the name of "Batavia", this technology would allow banks and their customers to automate this process, which is still very manual and is done on paper. Concretely, Batavia tracks a transaction from the departure of the goods until it arrives at the port of destination. Another example: Credit Agricole is experimenting with the blockchain for the transfer of money from their cross-border customers via the Ripple protocol. Affected customers can transfer their salary in Swiss francs to their French bank account in a few minutes instead of three days now. This operation can be performed via a mobile application. The blockchain will also settle transactions in real time, to have a "greater transparency of the exchange rate applied to the transaction and the reduction of structural costs," according to a statement from the bank.

Other industries are experimenting with blockchain, like Boeing. The US manufacturer filed a patent application for a blockchain-based system that would strengthen GPS systems for aircraft. The application published last December 14 by

the US Patent Office mentions an "onboard GPS system for rescue and anti-spoofing (GPS location spoofing)" that could be used in case of malfunction of the main system of an aircraft.

C. Application -3- Private blockchain versus public blockchain

What differentiates the private blockchain from the public blockchain is its degree of openness. The public blockchain is intended to be used internationally and everyone can afford to make transactions and expect them to be registered in the registry (if they follow the rules of this blockchain). This is really the case of the blockchain Bitcoin and Ethereum. In the private blockchain are widely used by companies to experiment internally, an organization or individual can modify the protocol at any time. Everyone can consult it but no one can participate without permission. They can also connect different information systems that do not speak well within the same organization. There is also the blockchain "permissioned" in which an entity has the controlling authority on the network. This is the case after the blockchain Rippe example because it is a start-up (same name) that determines who can validate transactions on the network.

D. Application -4- The consortium blockchains

The blockchain "consortium" groups together several actors who have rights and decisions are made by most actors. For example, a set of financial institutions could come together and organize a blockchain in which a block should be approved by most institutions to be valid. This is where we see the difference to the private blockchain and the public blockchain. Not only are the participants in the approval process limited and selected, but the majority rule is no longer required. This hybrid type blockchain offers a real advantage for financial sector players because they operate in regulated environments and are required to know the identity of the participants (which is not the case in the public blockchain).

IV. CHALLENGES IN THE IMPLEMENTATION OF BLOCKCHAIN TECHNOLOGY

Blockchain technology is [4] decentralizing systems, helping to solve power struggles and making Internet transactions more transparent. The disadvantage of a distributed register is redundancy. In a blockchain network, each node provides a copy of the transaction history. Each participant who participates in a consensus procedure such as proof of work performs the same calculation in principle. In addition, blockchain applications generate an immense amount of data that must be uploaded by each user during validation. Reducing the huge power consumption and other resources by blockchain applications with the same functionality is one of the central challenges in the development of blockchain applications.

Another challenge is to increase the transaction speed. Bitcoin, the blockchain solution with the highest market capitalization and number of transactions, processes an average of only seven transactions per second because of the computationally intensive consensus procedure. A value that cannot keep up with the processing speed of market-leading payment service providers. PayPal handles a lot of transactions at the same time, Visa theoretically too, and the fastest online payment system, Alipay from the Chinese group Alibaba, processes up to 200,000 transactions per second. A concept on how to speed up bitcoin transactions is provided by the Lighting Network project website. A similar project is available with the Raiden Network for Ethereum.

Blockchains work without Trusted Third Party. The security of the transaction is theoretically ensured by the decentralized administration of the transaction history. However, this only works in sufficiently large blockchain networks. For an interest group that manages to control more than 40% of network nodes, it would be easy to undermine collective validation and put an alternative transaction process into circulation. There is also a potential risk of manipulation if much of the computational power of an international block-chain network is provided by users in the same country.

V. CONCLUSION

One thing is certain: the Blockchain will come [5]. In fact, she is already there. While applications in the public blockchain like Bitcoin Cryptographic Money are primarily aimed at private users, most companies that dare to use the new technology initially rely on private blockchain solutions.

To determine whether Blockchain architectures will prevail over centralized systems in the future, the primary challenge is for the research community to overcome the barriers of data security and processing effort. Both uses of blockchain technology offer the potential to make processes faster, more transparent and more cost effective for almost any industry.

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