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Contribution of block chain technology to the banking sector

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Abstract:

Block Chain technology allows the storage and transmission of information in digital format without any intervention from trusted third parties (Middle Man), it is also characterized by decentralization and the ability to manage a large number of databases distributed around the world. .

It has numerous advantages that can improve several sectors such as finance, health, politics, insurance, energy, etc.

The financial sector is one of the sectors most impacted by this technology. The latter uses the P2P protocol which could facilitate the process of transactions while lowering their relative costs and reducing the time for their completion.

The purpose of this communication is to highlight the opportunities that block chain technology could bring to the operation of banks.

Keywords: Block Chain technology, banks, crypto currency, transactions

JEL Classification: G21; G24

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Introduction

Block Chain actually appeared in the world with the creation of the crypto currency bitcoin by Satoshi Nakamoto. Bitcoin was the first application of this technology in the world. As an important technology underlying the digital industrial revolution that has dramatically changed the profile of the global economy. (Khawatira, 2022).

Today Blockchain can be used in several sectors including finance, politics, health, etc.

Used in the field of finance, this innovative technology could facilitate the process of financial and banking operations.

In addition, this technology lowers the costs relating to financial transactions and reduces the time of the operation.

This technology could also be used by stock brokers to guarantee transparency of purchase and sale operations of stock market securities.

What is the Bloch chain?, what are its components and how it works? How does it contribute to improving banking and financial transactions?

It is around these axes that the subject of this communication revolves.

1-Definition of the Bloch Chain concept

Block chain technology is one of the most important innovative technologies of our time. (Djihad & Chettouf, 2022)

The Bloch Chain constitutes a database which contains the history of all exchanges carried out between its users since its creation, secure and distributed: it is shared by its different users, without an intermediary, which allows everyone to check the validity chain. » (Liberties)

Block Chain or the chain of blocks in French is defined as a technology for transmitting and storing data in digital format without a control body. In addition, Block Chain technology can be considered as a large distributed register which makes it possible to record the movement of money, delivery of goods and services, exchange of secure data and others (Melian, 2015) is characterized by decentralization, that is to say that there is no control body that manages or intervenes in the operations carried out within the Block Chain.

This technology contains the history of exchanges from the date of its creation without any modification (Zibin , Shaoan, Hong-Ning , Xiangping, & Huaimin, 2017)

2-**Characteristics of the block chain**

The Block Chain is extremely secure and transparent thanks to the way of which it is designed and managed. Users cannot add, delete or modify recording history without being detected by other participants.

However, transactions via Block chain technology are carried out directly without the need for these intermediaries thanks to the Peer-to-Peer (P2P) model in French Pair-to-pair. (Buterin , A Next-Generation Smart Contract and Decentralized Application, 2017) Peer-to-Peer is a data exchange model in which the computer plays two roles simultaneously, server and client. The peer-to-peer system can sometimes be centralized, that is to say, exchanges between computers go through a central server.

Computers connected to this network via the P2P Protocol are often called "nodes". The P2P system reduces transaction costs because consumers are no longer required to pay commissions relating to banking transactions.

3-How the block chain technique works?

Before examining how the block chain works, we will first see its components.

3-1-The components of the Block Chain

3-1-1 cryptographic hashing

Hashing transforms a random data input (keys) into a string of bytes of fixed length and structure (hash value);

«The hash of a transaction makes it easier to identify it on the block chain. Indeed, cryptographic hash functions are often used to achieve numerous operations within the block chain. » ((https://www.bitpanda.com/academy/fr/lecons/quest-ce-que-le-hachage-dans-une-transaction-blockchain/))

«The fundamental goal of cryptography is to allow two people called traditionally, Alice and Bob communicate through an insecure channel such that a passive opponent Eve cannot understand what is being exchanged and that the data exchanged cannot be modified or manipulated by an active Martin opponent. (Barsky, 2017)

Functions Cryptographic hash functions are extremely secure.

3-1-2-Cryptographic keys

Cryptographic keys are absolutely important in the operation of the blockchain because they allow the transaction to take place between Bob and Alice. Indeed,

There are two types of cryptographic keys, the first is called symmetric and the other is called asymmetric. The first type is often used in transactions, with a code identical to that of the recipient. However, asymmetric key

cryptography allows you to have two different keys, the public key and the private key (public key and private key).
The public key is known by Bob and Alice, this key is used to sign the transaction (Used to sign the transaction), moreover, the public key is used to encrypt the transaction and the private key to decrypt said transaction (Guegan, 2017).

3-1-3. Digital signature:

The digital signature or digital signature in English is a cryptography technique used to verify the integrity of the information exchanged, to authenticate the information transferred and to ensure that the latter is neither modified nor manipulated. The digital signature is equivalent to the signature on paper and it uses asymmetric cryptography to encrypt the data sent (Schoaba, Gomes, & Castelo, 2011)

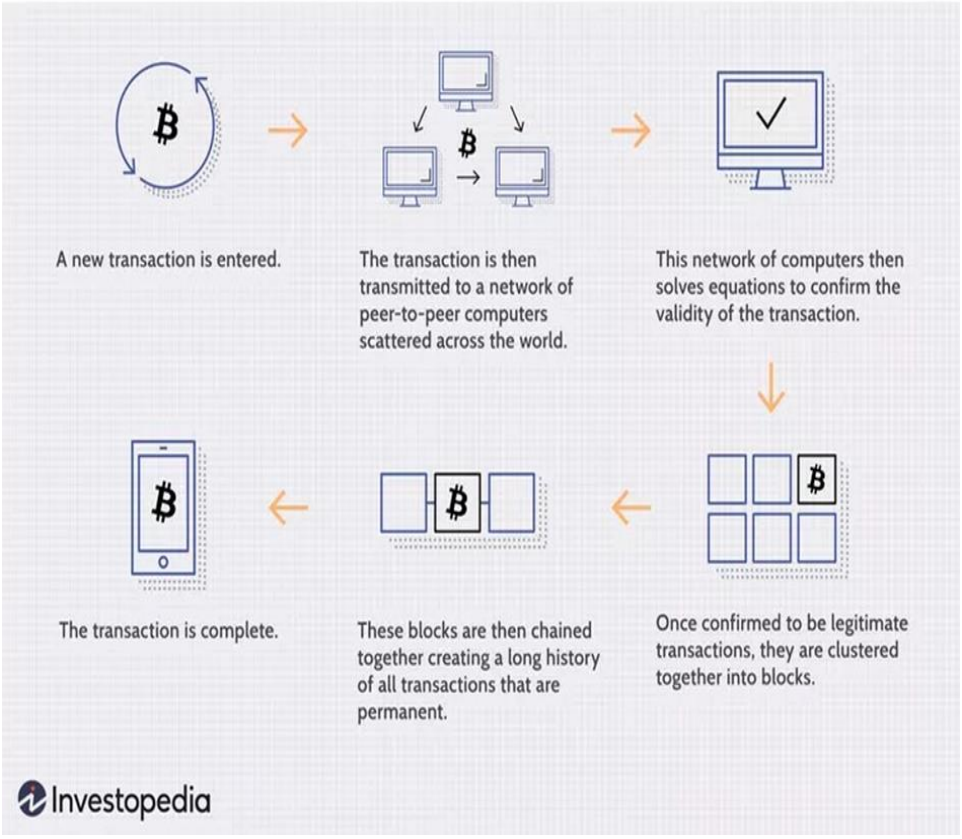
3- 1-4-Transactions

Carrying out a transaction on a block chain involves several steps of mechanisms. Here's a simplified overview:

- Transaction creation: The user creates a transaction by specifying the recipient, the amount and optionally other relevant details. Transaction signing: The transaction is cryptographically signed using the private key of the sender to prove their authorization.
- Transaction broadcast: Once signed, the transaction is broadcast on the block chain network to be verified and added to a block.
- Transaction verification: Network nodes verify the validity of the transaction by ensuring that the sender has the necessary funds and that the signature is authentic
- Block Inclusion: Once verified, the transaction is grouped with other transactions to form a block. This block is added to the block chain through a consensus process, such as proof of work or proof of stake.
- Confirmation: Once the block is added, the transaction is confirmed and considered irreversible, permanently added to the blockchain. These steps may vary slightly depending on the blockchain protocol (Bitcoin, Ethereum, etc.) and the consensus.

More transactions depending on the block capacity and transaction size, the data sent often includes the following elements, the sender's address, the sender's public key, the digital signature and the input.

Figure number (1): Mechanism for carrying out a transaction.



Source ; https://www.investopedia.com/terms/b/blockchain.asp

3-1-5-The registers

The purpose of the registers is to collect and record transactions carried out via the blockchain. Today, registers are digitalized and transformed into large databases to make it possible to record large volumes of transactions carried out every day**.**

3-1-6-The Blocks

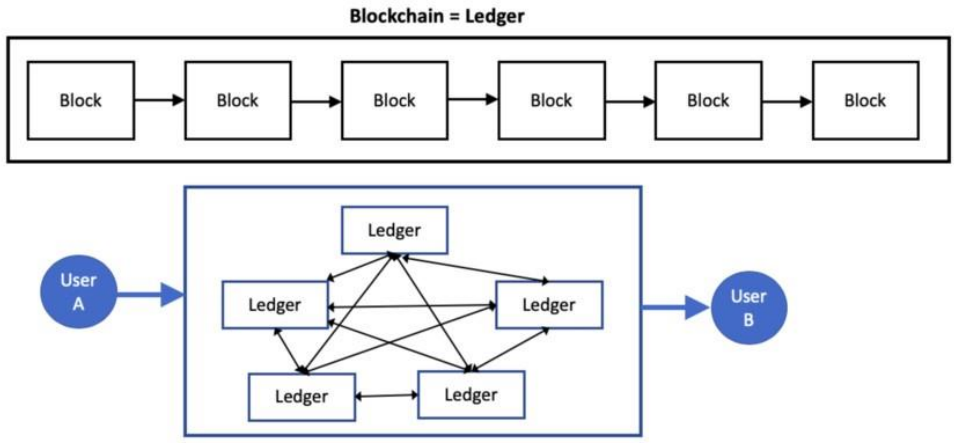
Transactions within the Block Chain are submitted by users of this technology via a platform which can be office software, application on Smartphone or a digital wallet. When transactions are verified and published by network nodes, they are grouped and recorded in a block. Block chain transactions are published only and only if the full nodes publish the transaction which generates a new block to save the latter. Generally composed of two parts, Block Header and Block Body.

 Previous block hash: Within the block chain, any block generated is the heir of the block previous one, in fact, each new block uses the previous block hash in order to create its own hash.

 The sequence of blocks:

Blocks are chained together via hash embedding from the previous block into each new one block created. This sequence makes it possible to have the chain of blocks. In case the previous block is changed for any reason, the hash would be different, which results in a modification at the level of the header of the block created.

Figure number (2): Schematic of the block chain system.



(Source: :https://www.researchgate.net/figure/Schematic-of-the blockchainsystem_fig1_343324642)

3-2-Participants of the Block chain

3-2-1 Miners

Minors are all people who put their computers in charge of verifying

transactions carried out in the block chain. Mining requires computers very

efficient with CPUs of good power in order to carry out calculation operations block chain complex

3-2-2-Nodes:

A node can be defined as any device in a network, a node can be physical or it can be a virtual node (Binance academy, 2018) . Indeed, a node is any electronic device that represents a point in a network where information can be received or sent, it can be a smartphone, laptop or desktop.

3- 3.Modalities for executing transactions via consensus mechanisms

3-3-1- Definition of consensus

Consensus in the Block Chain means that users and participants must have public Block Chain networks, we notice that there is a race between miners to create a new block, because this allows you to earn an amount of crypto - currency and fees for each transaction, each miner receives a gain for his participation in the operations of the block Chain. However, we can arrive at a situation where two nodes work on the same operation, in order to avoid these conflicts, public block chains use consensus models such as proof of work, (https://www.investopedia.com/terms/b/blockchain.asp, 2018)

3-3-2consensus models

- **Proof of work**

This consensus model states that the user publishes the next block provided that they are the first to complete the work. The pro user its work by trying the solution obtained.

- **Proof of stake**

It is a common consensus algorithm considered as an alternative to the algorithm.

POW, POS is inexpensive and consumes little energy. It involves the attribution of responsibility for managing the public registry at a participating node in proportion to the number of virtual currency tokens he holds.

Smart contracts

The goal of a consensus algorithm is to allow the secure updating of a state according to certain specific state transition rules, where the right to perform state transitions is distributed between (…) users who have the right to collectively make transitions via an algorithm" – (Buterin, A Next-Generation Smart Contract and Decentralized Application Platform., 2017)

The major objective of smart contracts is to provide greater security than traditional contracts.

4-Contribution of Block Chain technology to the banking sector

Block Chain is a technology that has existed since 2008 with the emergence of bit coin. Today, many sectors of the economy, such as banking, for example, are integrating this innovation into their traditional practices in order to gain time, efficiency and competitiveness. (https://www.lafinancepourtous.com/decryptages/finance-et-societe/nouvelles-economies/blockchain/la-blockchain-dans-le-secteur-bancaire/)

The Block Chain helps increase the efficiency of the financial industry by minimizing costs. More and more banks worldwide have started to take an interest in this technology and its applications in finance.

4-1-Adoption of Block Chain technology by global banks

Indeed, the financial sector is one of the sectors most impacted by this technology.

Block chain technology uses the P2P protocol to carry out the transaction by minimizing transaction costs. Indeed, major global banks have also started

to adapt the Block Chain to take advantage of the technology and improve financial services.

Block chain is a solution for financial inclusion. (Rahal & Ferouani, 2023)

4-2-The effects of this technology on the banking sector

4-2-1-Transparency and speed of banking and financial transactions

Block Chain technology and the Internet of Things today represent a significant opportunity for the revolution of several sectors including the financial sector.

First, Block Chain mainly attacks intermediation professions. These

The latter are considered the main activity of the banking sector because all

Transactions between traders are carried out within this system. In addition, banks ensure, as soon as they appear, the safeguarding of records relating to transactions to justify payments and limit embezzlement and fraud.

However, the Block Chain offers a similar solution, on the one hand, it is mainly based on the use of a named distributed register (Distributed leger), this register is intended to record all transactions from the creation of the block chain, moreover, this register is decentralized, in other words, there is no central unit to control this register. This latter is accessible to anyone, which gives the block chain transparency missing in traditional banking systems.

4-2-2-The Bloch Chain is Secure

Block Chain is extremely secure thanks to the architecture used to develop this technology. On the one hand, information cannot be added, modified, or deleted without being detected by users.

On the other hand, transactions can only be carried out if all the nodes give their agreements to create a new block to record these transactions.

«It ensures data security during transactions and payments between different users. » confirms Anne-Sophie Luçon, Practice Manager at Michael Page. Block chain has notably been adopted by banks to secure remote payments or stock trading, and to avoid hacking. It redistributes the

cards by offering a decentralized system, where authority is reassigned to the different users of the network. This multiplication of data allows the systems to be described as virtually inviolable. (Michael, 2018)

4-2-3-The Block Chain limits fraud

Take the example of Alice and Bob, Alice wants to buy a service provided by Bob, Bob has provided the service for Alice, but Alice did not pay Bob for his service. However, if Bob uses block chain, it will easily avoid this kind of problem thanks to smart contracts.

4-2-4-Bloch Chain reduces transaction costs

Block Chain uses the P2P system (Bitcon, 2008) to carry out the transaction: This protocol is often used in sharing files between users without the need for a central server to control downloads. The use of this protocol lowers transaction costs, in addition the user no longer has to pay the banking commission for banks which is often high for wholesalers carrying out large transactions.

4-3-Bloch Chain and payment operations

Checks can be issued in blank or used by anyone who has access to your checkbook, which obviously constitutes a significant risk if the bank does not systematically verify the regularity of your signature.

A card payment may also be rejected. “This regulatory-compliant block chain technology provides an extremely fast and secure means of payment that can be used by anyone with a smartphone, regardless of their financial situation, age or social status », (Kaluza).

Conclusion

The Block Chain allows you to:

 reduce transaction costs and improve verification of assets held by individuals

 improve the efficiency of data recording and safeguarding of information

 facilitate access to public funds and financial markets in complete security.

 Remove middlemen

The security of all payments made via the block chain is increased. However, the implementation of this technology requires people capable of mastering it professionally, especially since it is a recent and imperfect technology. It also consumes a lot of energy (cryptoast.fr/block Chain 2019).

Despite these drawbacks, this technology remains interesting in more than one way.

It represents an important opportunity for the revolution of several sectors including the financial sector.

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