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Blockchain Technology Applied in Health

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Summary of how blockchain works: -

Blockchain works in a pattern of distributed ledger where the transactions ledger is distributed along with the network

The main components for a blockchain to work and to make it more secure are

- Data
- Hash
- Hash of the previous block
- proof of work
- Distributed peer to peer network **Data:** - Data can be of any form like transaction details for the user, to whom to home transactions have been made

Hash: - Hashing is a form of encryption that is made according to the data and it's unique for each block in a chain, also it helps to find the block uniquely. Also, the hashing changes when any changes are made to the data in. block

Hash of the previous block: - Each block in the blockchain has a hash of the previous block stored inside it. It helps in recognizing that the chain is not contaminated or risked at any node. Temper with one block will change the hash of other blocks thus making it unusable affecting the entire chain

Genesis block: -The very first block in a chain is recognized as the genesis block

Proof of work: - a period which is required to change all blocks if an update has to be made

Distributed:-peer to peer work new node is created and sent to every user in the chain and block is verified, all node in the network create consents block tempered will be rejected, and to accept changes in the block all block should be changed re do a proof of work and take control over 50 % and more of peer to peer network only then it will be accepted

Keywords: Blockchain, Distributed Database, Healthcare

For a society to be effective, it must be healthy, without major problems that cannot be solved in optimal time. To solve these things as efficiently as possible, we need databases with sufficiently large information but also to remove the current issues whereby health is regarded as a business, not as a human problem that needs to be resolved. On computer networks, there circulates diverse information on health data. An optimal diagnosis, an appropriate medication, is to be achieved, taking into account that each body has different characteristics and reacts differently to medication. Taking these things into account, it is the question of databases that can be consulted in a controlled manner by: researchers to provide efficient solutions, the pharmaceutical industry produces the amount and type of drugs that are required on the market, and last but not least or the companies with counterfeit medicines are removed from the market.

If blockchain technology was successfully applied in the financial field, why could it not be successfully applied in the healthcare sector, which poses a major problem because it is working directly with human material here.

In the banking sector, using this technology, decentralized storage of transaction data can be achieved. This principle can also be applied in the health sector as regards the decentralized storage of patient status and care data.

If everything is done centrally when the patient is on the second plane, the delay times are high and they work to the detriment of the human, the newly proposed models eliminate all these things.

Businesses of this type run in a decentralized manner no longer require third-party intermediaries, payments being made through crypt-coin

2. BLOCKCHAIN TECHNOLOGY

If we try to define what blockchain technology is, we could say it is a form of creating trust among strangers, allowing for peer to peer trading, so that values can be transmitted securely between members of a network, without requiring a third party to contribute with its authority, allowing the redistribution of value from monopolistic authority to the network and decentralizing the architecture of the market. [1] With the help of this technology, digital information can be known through the distribution system by a large mass of people instead of being copied.

The database is stored at the same time on millions of computers so that it can be accessed by anyone exposed in the public domain. The common and the always up-to-date database contains the information stored in the blockchain.

Current databases do not allow data to be viewed and updated from multiple locations at the same time, but there is a delay in passing documents from one consultant to another. Google Docs (or Google spreadsheets) can allow simultaneous access and visibility of the document with the same version. The higher the number of people building information this the way data is distributed is significant. So this principle would apply to the blockchain. [2. 3]

Blockchain:

- Cannot be controlled by a single entity;
- The security of his blockchain is very high because he has no weak point. [4], [5]
- Blockchain technology ensures the security of validation of a transaction recorded in the main block as well as in the complex distributed block system. [6]
- Blockchain technology acts like a particular type of distributed database. [7]

3. DISTRIBUTED DATABASES PREPARE

A distributed database is a collection of multiple interconnected databases that are physically spread across sites and communicating through a computer network.

It is characterized by:

- Database collections are logically interconnected. They are often a single logical database;
- Data is physically stored on multiple sites;
- Data from each site can be managed by a DBMS independently of other sites;
- Processors in sites are connected over a network;
- A distributed database includes transaction processing, but is not synonymous with a transaction processing system.

A distributed database management system (DDBMS) is a centralized software system that manages a distributed database on how to treat multiple location (where the data are stored) as one. It is characterized by:

- Used to create, retrieve, update, and delete distributed databases;
- Synchronizes the database periodically and provides access mechanisms to make the distribution transparent to users;
- Ensures that modified data on any site is universally updated;
- Used in environments how to use large among of date and they are accessed by a large number of users;
- Designed for heterogeneous database platforms;

- Maintain the confidentiality and integrity of database data.

Blockchain does not store the information on a single server but is a system distributed on multiple computers simultaneously and allows any access without being destroyed. A so-called public electronic journal will be formed; each record is called a secure block

4. BLOCKCHAIN IN HEALTH

A global computer network uses blockchain technology to jointly manage the database that records patient data such as laboratory results, medical imaging, medication, reuse obtained after application. The database is managed by its network, not by a centralized network (peer-to-peer network). So, the blockchain can be compared to a library that allows the storage of all the books containing the patient's health data, but also data such as prescriptions, medical imaging, or biological exams.

No matter where these data are obtained, they are reunited and a complete picture of the patient can be made throughout the medical act.

In each block all the necessary information (such as like hour, date, participants and transaction size,

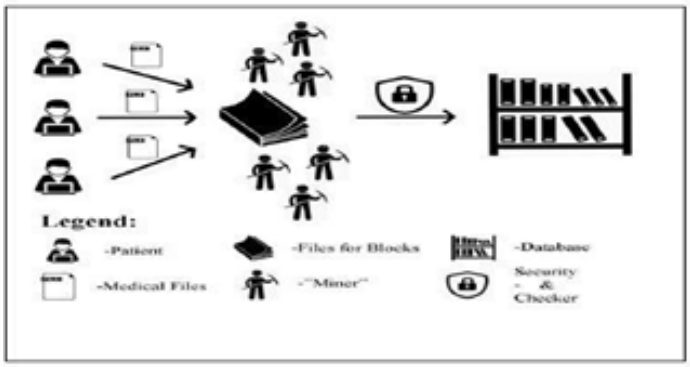


Figure 1

information about the previous block and the network) are saved.

For these data to be stored in the virtual catalog of transactions, they are check by a miner, and (if everything is alright) it will encapsulate the data as well.

The term miner is attributed to the process of writing, encrypting information, and introducing it.

Figure 1

Figure 1 Transmission of data to patients – virtual catalog

Adding a new block is done by complex mathematical algorithms processed on each user's computer and they are rewarded by cryptocurrency. No blocks are added to the block of blocks without the consensus of network nodes (miners).

Figure 2

But this technology does not allow access to highly specialized processors with the help of visualization unless the person is authorized for that purpose. The patient will give his permission using a digital contract. If the person is confirmed by the system under the contract, then that person is allowed to view the data securely. Encryption is done with sophisticated mathematical algorithms in a virtual catalog.

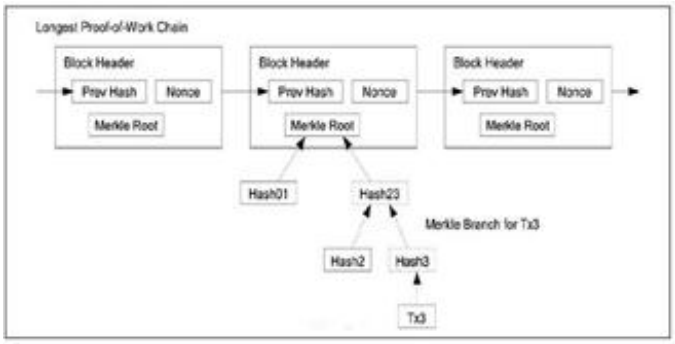
The information entered into a block can no longer be removed, it becomes public as long as the computers are connected via the Internet to the software blockchain the process of erasing or modifying the data will be very hard (almost impossible). Running the blockchain as a web infrastructure should not be understood to be a user of it. [9], if all the data of a patient were kept within the blockchain: recipes, biological examinations, different

A block is made up of several transactions, and several block connections make a blockchain data block.

The transaction is validated encrypted and stored by a processor for public consultation figure 2.

treatments, there would be no need to keep archives in hospitals, allowing the pooling of all the patient's medical data in one place and obtaining very fast results in case of need. The mechanism could work, not having everyone access to the blockchain. The patient should be the one who decides who has access to his files in that block. This also proves to be just a concept that would bring a more transparent health sector that would give the patient the due respect.

Figure.3



CONCLUSIONS

If this technology were to be implemented in the medical industry, all people would only gain from this business, but for various reasons, this was not yet done, perhaps because in this case, people could become the main point in what regards the medical services offered.

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the medical industry, all people would only gain from this business, but for various reasons, this was not yet done, perhaps because in this case, people could become the main point in what regards the medical services offered.

Patient file (data) is complete, available at any time, all data (transaction) are monitored in real-time.

For some researchers who want to collect more medical data to help them in some way, in the first phase most of the time need to collect a lot of papers from the hospital archives to gather as much data as possible. This slows the study process.

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