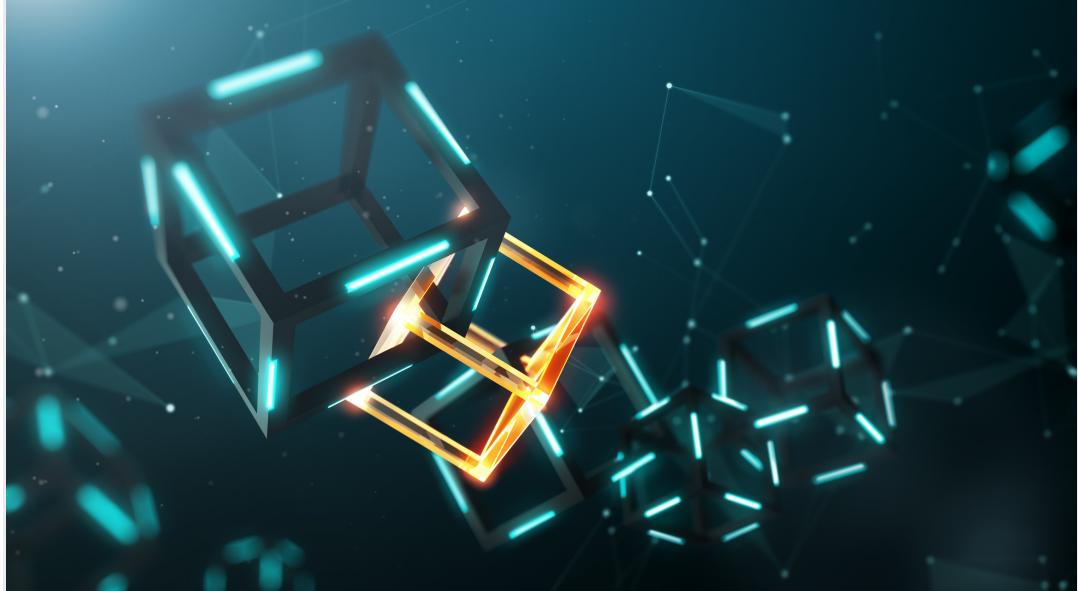


Three ways to use blockchain in medicine

Denis Baranov, Principal Consultant at DataArt, discusses ways to address current issues facing the healthcare industry with the help of blockchain technology



With blockchain being the hot topic that everyone's talking about, we get the impression that the technology will be used almost everywhere in the near future. Contrary to popular belief, it will actually be of more limited use.

Why do we need blockchain in general?

Blockchain mainly solves the problem of trust in a complex environment. As an example, blockchain and crypto-currencies initially became possible because the use of this technology does not require the participation of a centralised organisation.

Previously the use of currency was based on the government's guarantee of its value. Blockchain makes it possible to develop a decentralised system with a set of rules that are nearly impossible to circumvent. Blockchain also makes it possible to automate processes with smart contracts. However, even this is a controversial area. There are many technologies that help automate processes that offer similar value to blockchain.

Blockchain technology was initially applied in finance. Although many still find it difficult to envision the many uses for the technology in our industry, there are various products currently in development and now being introduced, three of which I believe could work well.

Tracking the supply chain

The most basic use of blockchain in healthcare is to facilitate tracking capability in the supply chain; for example, tracking drugs in general, or narcotics that are subject to special control. This is the most natural case, because blockchain has already been used in supply management for some time.

As a consumer of pharmaceutical products, I cannot track the manufacturer of the product at the pharmacy. The share of counterfeit drugs varies from 15 per cent in countries where the state controls the pharmaceutical market, and up to 80 per cent where it does not. When purchasing medication, you can request a certificate of authenticity, but there is no preventing an unscrupulous supplier or seller from falsifying such a document.

If all the information is stored in blockchain, from production to arrival at the retail pharmacy, it is theoretically possible to track the entire chain. It is clear that further functionality can be added to this system, for example, monitoring the availability of medicines in polyclinics. We can see to whom the drugs were transferred, the quantity, and more. This requires the package to be labeled with a barcode, according to which a special application is included in blockchain.

Immutability

However, in this case the second important feature of blockchain is clear: immutability. Information cannot be changed or deleted, and this is a huge advantage over a database, in which data can easily be falsified.

Some companies have been already working on creating such systems, for example, the [MediLedger project](#) shows some promise, unifying pharmaceutical market participants including such giants as [Pfizer](#), [Genentech](#) and a number of premier distributors. The project was launched in 2017 and continues to be worked on by developers, with the first commercial solution to be presented sometime in 2018. If information is transferred to blockchain, the situation changes fundamentally. It is possible to implement an application with which the patient themselves will temporarily provide doctors or research organisations access to his or her data. They will independently bear responsibility for third-party access to their medical records, and the application will be absolutely transparent in terms of who uses it and how.

It will not happen tomorrow, because such a process requires building a community. The process is somewhat comparable to developing an open API idea in the banking sector. Today this is the standard procedure for any bank and makes it possible to look at transactions.

Protection against hacking

Creating the same open API or an open-banking analogue in healthcare may be the next big step towards blockchain and the development of the industry as a whole. Today data transfer between systems remains a serious problem.

The impossibility of hacking the system and deleting data makes it possible to develop this idea. For example, data can be used by insurance companies, but only with the consent of a client. So, any of us will be able to grant access to medical records in exchange for a discount. Currently we have to enter data manually, and the insurers have to either take our word for it or arrange for an examination.

There is an alternative example – when you're travelling abroad, you are a mystery to doctors in case of injury or illness, as they have no medical history. If a non-resident needs surgery, for example, there are no records to consult for vital information. What if the patient is allergic to anesthesia? All the doctor has to go on is what the patient can share. Memory can be faulty, patients can be less than forthcoming, or in the case of serious illness or injury, they may be unable to speak. The possibility of solving this problem with blockchain is now being studied by several organizations. For instance, [SimplyVitalHealth](#) has already developed a system that makes it possible to exchange patient data between clinics. At the end of 2017, the company announced the development of a new, larger infrastructure system.

Opportunities

These are three contexts in which blockchain, in my opinion, does not look like a fleeting trend. It is clear that economic viability plays a key role in the introduction of new technology. But in these cases, the beneficiaries are obvious – they are not only patients but also clinics and insurance companies.

Blockchain also has untapped potential to be used in conjunction with IoT and medical devices and make its own unique contribution to medical advancement. Most of the current concerns surrounding medical devices centre around data security. Blockchain could help solve this problem by ensuring a smooth and secure exchange of data that is unhackable. In addition, imagine a surgical medical device connected to a blockchain network. The device could respond in real-time to unknown situations at any connected hospital based on the insights gained from the blockchain network.

Unlike in the financial service industry, new products are introduced much more cautiously and slowly in healthcare. As the industry is one of the most regulated and conservative, the introduction of new technology requires serious financial investment. For example, in order for clinics to be able to exchange patient data even within one country, it is necessary not only to create a common network, but also to provide additional staff training and health facilities with much higher levels of cyber security.

All of this has a noticeable effect on development and is unlikely to allow us to see large-scale medical projects implemented in the blockchain over the coming months. However, even a limited implementation of blockchain has potential to open our eyes to what could be possible in the future.

Original article can be found here: <https://medtechengine.com/article/blockchain-technology/>