



# How blockchain networks could radically empower patients

***Kirill Timofeev, lead software project manager at global technology consultancy DataArt, explains how blockchain networks can empower patients.***

Unfortunately, under current systems, it often falls to patients themselves to arrange for the sharing of key records among offices and doctors. This inefficiency costs the entire system money, requires substantial time investment and compromises health services as a whole.

Deployed in the right way, Personal Health Records (PHRs), a collection of information on an individual's health, are powerful tools that help doctors to manage a patient's health more effectively. While information included varies, it usually covers date of birth, allergies, medications, chronic health problems, family history, with more sophisticated varieties also covering measures that the patient must take to improve health, such as exercise, stopping smoking or losing weight. Broader adoption of the electronic sister of PHRs, the Electronic Healthcare Record (EHR), would not only improve care, but also reduce costs.

Even more compelling is the potential of the EHR to be a lifesaver. In an emergency it allows first responders to access critical consolidated medical information on the spot.

The introduction of an effective EHR-based system, however, is beset with obstacles:

## **The cost**

There is a significant upfront technology cost in integrating healthcare records that were never designed to manage the complexities of multi-institutional interoperable data.

## **The location and organisation of records**

Clinical records are isolated along the lines of "your data is your data, and my data is my data". Furthermore, patients leave data scattered across various organisations as life events take them from one provider to another, making it difficult to deliver high-quality healthcare services. This prevents citizens from taking control of their healthcare needs and improving their overall health.

## **Time lapse**

It can take just a couple of seconds for an email to go around the world and reach out to a recipient, but it can take days or weeks to transfer EHRs from one provider to another. Things are slow, and they are centralised. With many hospital systems, doctors can't even communicate effectively with other healthcare providers – for lack of a useful system. A claim submitted in one system will have to go through many intermediaries before it reaches a doctor who provided a service. Because of the hidden complexities in operational processes and software systems that manage them, test results never “magically” appear on the desk of the right doctor.

### **A solution emerges...**

What if there were not only EHRs spread out across institutions? What if there were a network that was immediately available to everybody, while at the same time keeping confidential and sensitive information private, a network in which every EHR could be stored, moved, and exchanged, almost instantaneously? Enter blockchain...

It is no secret that distributed technologies have been extensively researched over the last decade. For the first time in human history there is a solution that could provide a native trust between stakeholders and other participants. Blockchain, which evolved out of the earlier research, can create a mathematically and algorithmically proven network, powered by collaboration, without powerful intermediaries, one where trust is a first-class citizen.

Blockchain as a technical infrastructure to support clinical data sharing could reduce overall costs for patients accessing their healthcare records. Patients could have more control over who sees and what's more important uses their data, while healthcare providers could also provide better services based on more accurate data. It could catalyse health information exchanges (HIE) on national and international levels. Distributed ledger technologies (DLT) could also be used to help patients choose a provider and, where appropriate to make billing processes transparent. Bringing patient records together not only enhances healthcare for a patient, it is a potential life-saver in an emergency.

Distributed ledger technologies are in the early days, but there are definite data security and interoperability benefits that could help to reduce data issues in the healthcare industry. It could solve the current disconnect between patients, healthcare, and life science institutions: medical records, clinical trials, remote monitoring, billing and other sources could be efficiently submitted and aggregated in a blockchain network that would be shared between providers and accessed by patients. Such systems could have permissions and access control layers built into the design of the product itself from the very beginning.

### **What DLT technologies exist that could work?**

There are various flavours of distributed ledger technologies that are already in advanced stages of development. Very popular with developers is Hyperledger Fabric, a platform for distributed ledger solutions delivering high degrees of confidentiality, resiliency, flexibility and scalability. Intended as a foundation for developing applications or solutions with a modular architecture, Hyperledger Fabric allows components, such

as consensus and membership services, to be plug-and-play. Channels supported in Hyperledger Fabric allow for data to go to only the parties that need to see it.

Another front-runner is R3 Corda, a technology for building interoperable blockchain networks that transact in strict privacy. It is designed to record, manage and automate legal agreements between business partners. R3 Corda is designed by (and for) the world's largest financial institutions yet with applications in multiple industries. It offers a unique response to the privacy and scalability challenges facing decentralised applications.

### **The caveat**

In order to make a blockchain solution effective, it is crucial to identify key stakeholders and counter-parties that will be joining, to secure the network and to be prepared for a large-scale digital transformation program. Momentum must be maintained as is commitment to growing centres of excellence that would be on hand to jump in and help to streamline integration between partners. Blockchain technology could, nevertheless be a game-changer for patient empowerment.

If it's done, it has to be done right. It would be pointless to build a blockchain solution without a deep understanding of how such systems function, without making them compatible with existing platforms and protocols, and ultimately with a digital transformation strategy plan that will be supported on every major level in the organisation.

Author Jane Jacobs said: "It may be that we have become so feckless as a people that we no longer care how things do work, but what kind of quick, easy outer impression they give. If so, there is little hope for our communities or probably for much else in our society. I do not think this is so."

A blockchain is a great catalyst, although not the whole answer. In order to give the best in patient care, healthcare providers must collaborate in the creation of a proper interoperability model, in-line with all regulations and existing standards. It is hard, but it is possible.

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