Blockchain has the potential to transform healthcare in India

Recently we came to know about an interesting incident at a corporate wellness camp. The health workers recording the vital statistics of the participants were making key mistakes in recording the observations. A good example was the height of one of the participants was recorded wrongly as 147 centimeters instead of 157. Immediately the participant became obese as per the record. Similarly BP was recorded wrongly for another participant. Though both mistakes were eventually rectified, we were left wondering how many such errors happen in the healthcare ecosystem daily and what the consequences of these errors are.

Also In our opinion having historical medical data would have given some guidance to the health workers collecting data. For example the height of an adult would not change. Similarly looking at the pattern of previous Blood Pressure readings would have given the health workers an indication of whether they would need to take that reading again. Collecting, managing and storing healthcare information is the key to maintaining quality and improving care outcomes

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Global challenge with healthcare data

The experience from other countries is not very different. US based healthcare organizations have spent around $ 93 Billion over the last five years in just data sharing costs? Surprised? Healthcare data can be complex – in part due to the non-linear nature of diagnosis and treatment, and also due to differing healthcare standards across regions in the world. Additionally, data privacy and other related laws can make healthcare information difficult to access and share. So much so that in many countries, including India, a patient may not have complete access to his/her medical record!

Considering that the next paradigm shift in healthcare is expected to come from the adoption of digital technologies – whether for patient experience or improved efficiency of hospital tasks – it is important to address current challenges around data sharing and access, lest they become hurdles to progress. In that context, block chain could be a savior for the industry.

What is Blockchain?

Blockchain is a continuously growing list of records, called *blocks*, which are linked and secured using cryptography. Each block contains, typically, a link to a previous block, a timestamp and transaction data. Transactions have to be approved by all users of the block chain to be stored and modifying an older block of data is impossible. Only updating of future records is permissible making the system secure (relatively speaking) and therefore reliable. This also means, an entire block chain can serve as a secure ledger that records transactions, negating the need for multiple disparate trails of information.

We believe Indian healthcare has most to gain from the adoption of blockchain technology. For starters, blockchain allows all types of data to be integrated into the chain. This means one can add not just doctor prescriptions and treatment records but also nutrition information, fitness data, and recordings from medical devices (such as for blood pressure and diabetes patients) by patients themselves. Over time the presence of such longitudinal patient data means care givers can better interpret disease symptoms and prescribe effective treatment that is customized to work for the patient. Currently, doctors rely on data from treating different patients to prescribe medication. The chances of success for such medication are about 50%. In many cases, doctors wait for feedback from patients to change the medication. With availability of longitudinal patient data, doctors would know in advance what treatments are more likely to suit a patient in line with his/her health history.

If effected over large scale, block chain could help significantly lower healthcare costs in India. In addition, it can give

multiple parties selective access to patient records ensuring data is not compromised. A survey report by IBM outlines the following healthcare areas benefiting from block chain: clinical trial records, patient health records, regulatory compliance, medical device data integration, treatment records, billing and claims, asset management (for hospital assets such as beds/ equipment available), and contract management (for hospitals).

In India we have been working on a new model for sharing and accessing Healthcare records over Blockchain. We are calling it Healthchain.

Healthcare Blockchain

Proposed model for Blockchain in India

Healthchain is decentralized, distributed and anonymous platform which brings security, transparency, accessibility, and speed in EHR. Healthchain stored the EHR and the immutable ledger maintain makes it the single source of truth. All the records cryptographically secured and need owner's permission. Same way, it's distributed and decentralized so as a patient you need not riley on a single entity. It allows different participants like doctors, hospitals, Labs, insurance company, and research agency to be part of Consortium. The patient is a base and key player of this solution makes him the owner of his records. He can access his records instantly across the globe; he can share or give timely permission to other participants to access his medical records and/or history for medical use. In fact, by sharing personal health records patient may get some discount from the insurance agency and also get a reward from health researcher.

In short, Healthchain gives rights and freedom to patients with their EHR by the power of Blockchain. Below is a representative diagram of how Healthchain would work in the Indian set up.
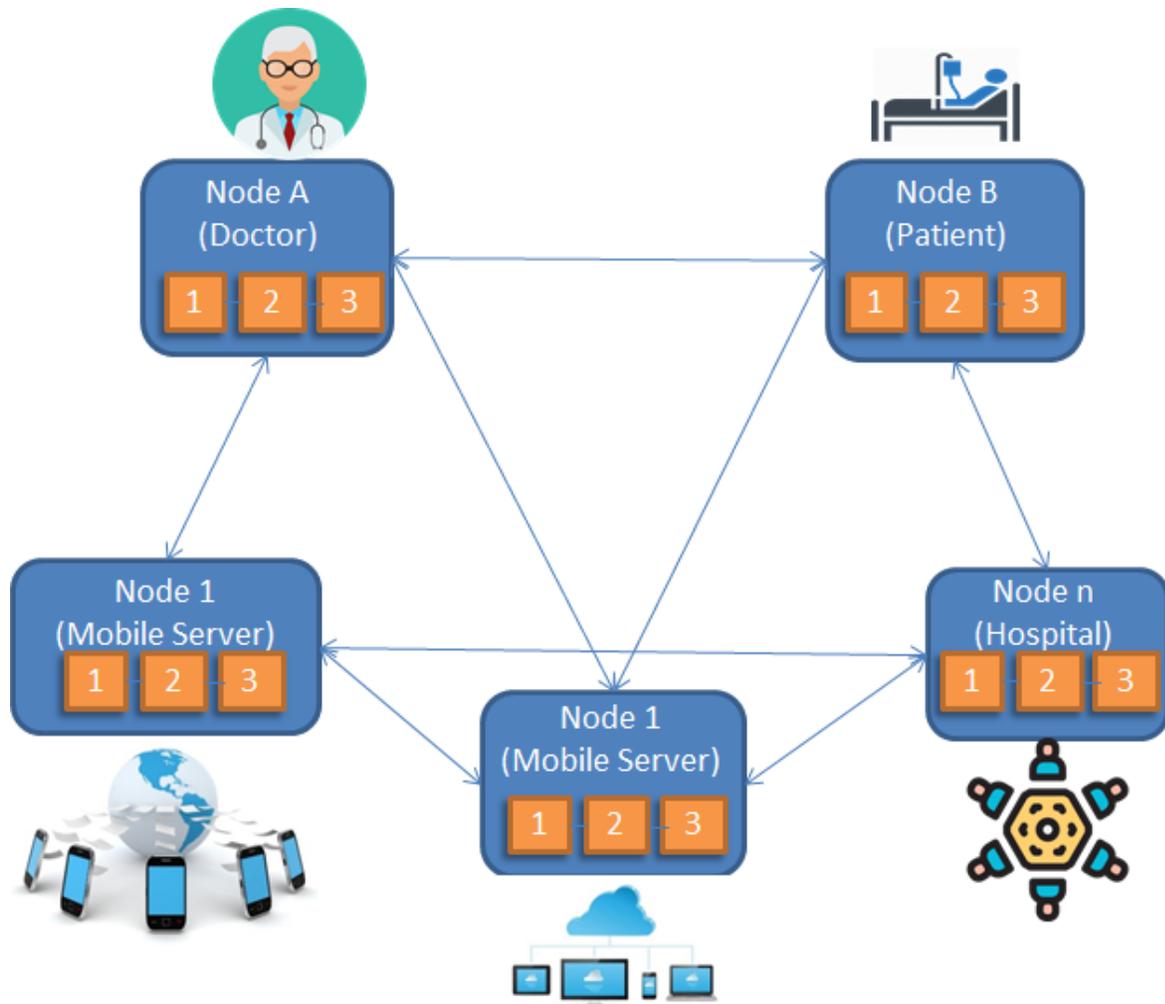
The other area where Blockchain would be adding value would be in the area of disease surveillance. Given the demographics of the country and lack of Blockchain adoption across the world resources, a real time update on spreading disease patterns would help us channelize resources very effectively.

Currently there are a few pilots running on Blockchain in Healthcare. Interestingly Estonia is already one of the most advanced nations when it comes to Blockchain implementation and has already been using Blockchain to deliver citizen and government services. They are planning to enable healthcare records of all their citizens on Blockchain. In 2016 Estonia digitized all health records and this is a critical first step towards the success of a future Blockchain implementation. Currently all citizens in Estonia already carry a card with a unique id, similar to the Aadhar card in India. It will be interesting to see the results once all health records in Estonia are Blockchain enabled.

The state of Dubai in the UAE is also on a similar path. They are planning to put the entire citizen services on the Blockchain. They are also encouraging Blockchain for land records and for private entities doing business in Dubai.

Closer home in India, the new state capital of Andhra Pradesh, Amravati is using blockchain to procure land for the state capital and build land records

A similar exercise is underway with NayaRaipur in the state of Chhattisgarh.

Another good Indian example Axis Bank that is working with Ripple to use blockchain for cross border payments. So individual customers can use Rak Bank network in the UAE to send real time cash transfers. Institutional investors can use Standard Chartered network in Singapore to do the same thing. With real time cross border payments, the chances of fluctuation in the amount received due to exchange rates is reduced significantly.

Managing Risks in the Blockchain

Many experts have proclaimed that the blockchain is secure and is inherently without risks. That is unfortunately not the case. Blockchain by design was built for public use and does not have built in access controls. That means when we use a private blockchain, then the corporation would have to building access controls and a strong identity and access solution to ensure that the nodes remain secure.

The second challenge is how to deal with regulations. A good example is GDPR. As per the new regulation that would come into effect in late May, a citizen of Europe has the right to be forgotten. But how does that work in the blockchain where every entry is immutable.

Finally, most encryption in the current enterprise is to protect the data. Do even if the keys are compromised, all one must is to create a new set of keys and move on. But on the blockchain, the keys need protection as well. The keys are important to move transaction and if the keys are compromised then the person with the keys can move transactions.

There are also some issues on how contract disputes will be resolved on the blockchain.

But like all other new technologies, Blockchain has the potential to transform the industry. Healthcare would benefit immensely and India which does not have widespread use of HIS leave alone EMR could leapfrog growth by adopting the blockchain.

 We propose the following steps to ensure you get the most out of your blockchain implementation.

Conclusion

Traditionally, healthcare has been a laggard when it comes to embracing new
technologies. However, the interest and exploration of block chain among other
industries – finance and pharmaceuticals – may fuel block chain adoption in the
healthcare industry in the coming years.

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