Health Matters

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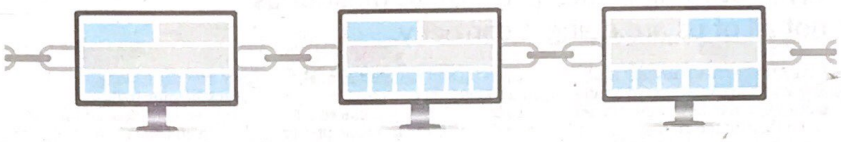
Using blockchain in healthcare

This new technology can be used to track drugs and allow access to patient records, among other uses, in a secure manner.



Blockchain can be thought of as a type of database that can be shared among any given number of users in a distributed and decentralised fashion, where no one person has control over it. — 123rf.com

BLOCKCHAIN technology has featured prominently in the public imagination since the invention of Bitcoin by an unknown person or group of people going by the name Satoshi Nakamoto in 2008.

In fact, there is considerable confusion between blockchain technology and Bitcoin, with many thinking the two are the same.

However, there is far more to the technology than cryptocurrency.

It is best to think of blockchain as a type of database that can be shared amongst any given number of users in a distributed and decentralised fashion.

No single person has control over this database.

It is also unique in that there is a digital log of all the transactions related to it.

Equally importantly, the data is cryptographically secure, which means that only those with the correct cryptographic keys will be able to read or write into the database.

The blocks of information are chained together, creating an immutable audit history.

The combination of these features presents unique opportunities for the usage of blockchain.

Tracking drugs

Globally, blockchain technology in the healthcare industry is estimated to be worth around US$500mil (RM2,044mil) by 2022.

It can be used in adjudication of insurance and claims, credentialing of healthcare providers, drug and device supply chains, personal health records and health data exchanges, as well as research and clinical trials.

Static registries (databases that store static information) can be used to verify the authenticity and legitimacy of products.

This helps to attest to the pedigree of items from the point of manufacture to consumption.

For example, it can be used to track vaccines from the manufacturing plant to the point of administration.

Malaysia is expected to receive our first batch of Covid-19 vaccines in the first quarter of next year.

The Health Ministry (MOH) has given the green light for the Science, Technology and Innovation Ministry (Mosti) and Mimos (our national applied research and development centre) to kickstart a related vaccine-tracking project based on blockchain technology as a proof-of-concept.

If proven effective, it will be integrated into the existing MOH pharmaceutical track-and-trace system.

The vaccine-tracking can be used not only for the Covid-19 vaccine, but also any other vaccine or drug in Malaysia.

It will start with the serialisation of each medicine, with tracking done from the manufacturer all the way down the supply chain to the doctor giving the drug and the individual receiving it.

This system can then be used to provide a "Digital Health Certificate" that complies with international standards (e.g. the CommonPass that is backed by the World Economic Forum and the Rockefeller Foundation), thus facilitating travel and cross-border movement.

Medical record access

Blockchain technology can also play a role in improving access to patient medical records.

Institutions that store electronic medical records lack interoperability, i.e. the database in one hospital cannot "talk" to its counterpart in another hospital as they usually operate in silos and utilise different types of software.

This leads to a high level of inefficiency as doctors in different hospitals dealing with the same patient will not have access to the patient's history of previous investigations and management plans.

A universally-accessible blockchain will allow data to be accessed by relevant stakeholders (e.g. patients, medical staff and insurance companies) in a secure and authenticated fashion.

Access can be granted by the patient, using smart contracts.

This not only places the control of personal health data in the hands of the individual, but also acts as a disincentive against repeated investigations and delays in providing timely care.

The same concept can help with improving medical insurance claims.

As patients, we may deal with many different doctors and clinics or hospitals, which means that bits and pieces of our medical history exist in separate places.

Placing medical records on a blockchain that allows appropriate access will not only allow faster access for insurance companies, but also help to reduce the incidence of fraud.

Hurdles to adoption

In 2018, the United Arab Emirates launched its Emirates Blockchain Strategy 2021.

This plan not only aims to capitalise on the technology to transform half of all their government transactions into the blockchain platform by 2021, but also focuses on four themes: happiness of citizens and residents, elevating government efficiency, advanced legislation and international leadership.

As part of the Strategy, efforts were made to identify hurdles.

As it turns out, the biggest challenges in adopting the technology were not technical, instead they were:

> Difficulty bringing together the required stakeholders
> Unclear regulatory implications
> Education and awareness of the involved stakeholders
> Identifying and understanding the most relevant applications of blockchain
> Addressing governance

The levels of uncertainty that occur as a consequence of rapid advances in technology usually lead governments to create regulatory sandboxes.

These allow new innovative products and proof-of-concepts to be monitored carefully by regulators in a live testing environment.

In Malaysia, Mosti has introduced the National Technology and Innovation Sandbox, which aims to identify and address the policy ambiguity that arises with any new disruptive technology.

However, the main hurdle to widespread adoption is more prosaic, i.e. connectivity.

Although Malaysia has experienced significant growth in the use of information and communication technology, there exists a digital gap that is leading to increasing digital inequality, especially for those in rural areas, poorer states and low income groups.

Other demographic factors also play a role, with the gap increased for women, senior citizens and the differently-abled.

In a recent forum by the Social & Economic Research Initiative (Seri) on blockchain, Science, Technology and Innovation Minister Khairy Jamaluddin not only alluded to the need for better connectivity, but also the need to create more awareness of disruptive technologies such as blockchain.

This would include not only public messaging campaigns, but also the development of technology literacy and analytical skills amongst school students.

Ultimately, there are many digital technologies that warrant our time and investment.

Blockchain technology has the potential to positively disrupt the manner in which we conduct healthcare, amongst others, but such opportunities can only be grasped once we have access to basic infrastructure, while mastering the necessary mindset and technical skills.

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