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Will Blockchain Transform Healthcare

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The Wall Street Journal recently noted that the United States "will soon spend close to 20% of its GDP" on healthcare. While it might not be possible to address the rising costs of healthcare in the immediate future, there are steps that can be taken to address issues of customer service and efficiency to improve the overall healthcare experience, while ensuring the protection of customer privacy. In recent months, there has been a flurry of excitement about the role that blockchain technology might play in the long-term transformation of U.S. healthcare.

I recently spoke with a few individuals who are deeply conversant in the challenges facing healthcare and how solutions like blockchain can be brought to bear. John Halamka is Chief Information Officer of Beth Israel Deaconess Medical Center in Boston, a Harvard University teaching hospital, a position that he has held since 1998. He also held the position of CIO for Harvard Medical School from 2001 through 2012. Halamka recently assumed responsibility as Editor-in-Chief of the new academic journal, Blockchain in Healthcare Today. In the inaugural issue, published in March of this year, Halamka proclaimed his manifesto, "As the Editor-in-Chief of Blockchain in Healthcare Today, my goal is to publish high-quality opinion pieces and research papers about use cases that really require blockchain". Halamka continued, "Just using blockchain in healthcare because it's cool does not make sense".

Halamka knows of what he speaks. In his Journal call to action, Halamka goes on to note, "In 2017, I worked on several production blockchain applications, so I have a sense what works and what does not. Blockchain is not meant for storage of large data sets. Blockchain is not an analytics platform. Blockchain has very slow transactional performance. However, as a tamperproof public ledger, blockchain is ideal for proof of work. Blockchain is highly resilient". I asked Halamka about what he sees as the greatest healthcare challenges where blockchain could make a difference. Noting that blockchain is ideal for ensuring data integrity where control is decentralized, Halamka cites three prominent opportunities:

Medical Records. When a medical record is generated and signed, it can be written to the blockchain, which will provide absolute proof and confidence that a medical record cannot be changed. The integrity of the medical record is ensured. The same concept can be applied to clinical trials. This has impact in legal cases as well where the integrity of the medical record is pivotal.

Consent management. In the current healthcare environment where every state has different privacy and consent regulations, blockchain could be used to record patient consent for purposes of data sharing. Any party seeking to exchange medical data about a patient could check the blockchain for permission to do so.

Micropayments. The idea that patients might be incented is gaining traction. If a patient follows a care plan, keeps their appointments and stays healthy, there might be rewards offered through the blockchain. Similarly, patients might be rewarded for contributing their data to clinical trials and clinical research using the same approach.

Tory Cenaj, founder and publisher of Blockchain in Healthcare Today, adds, "Blockchain technology can elevate care excellence, and enhance the participation of owning one's health and data". Greg Matthews, whose mission is data-centered innovation in healthcare, and is creator of MDigitalLife, a platform for tracking digital trends in healthcare, offers an additional perspective, "Blockchain could make the biggest impact in healthcare in enabling health outcomes that take a 360° view of the patient's genetic profile, their demographic and socioeconomic status, the behaviors that impact their health, and their response to different treatments or combinations of treatments". Matthews continues, "This data exists today in one form or another, but can be tremendously difficult to stitch together at an individual level. Blockchain can enable "profile stitching", and do so in such a way that the patient's identity is protected".

A Blockchain Future?

Halamka observes how block chain is ideally suited to addressing the challenge of decentralization of medical data. "Most healthcare data is centralized at the level of a corporation, healthcare facility or government registry" notes Halamka. "Block chain is decentralized and therefore not impacted by the behaviour of any one organization. In the future we might see block chain as a component of a system in which patients serve as stewards of their own data, rather than relying on any central source". Matthews concurs, "We haven't been able to aggregate patient data in one place and secure it so that *only* the patient has control of it and can make decisions who they want to share it with".

Matthews envisions a future where block chain would play an integral role in healthcare improvement. He observes, "By using block chain in combination with AI and machine learning, we should be able to discover potential solutions to health problems that are devastating to us today". Matthews continues, "The dream of personalized medicine looked like an almost-insurmountable problem 10 years ago because of technical challenges in linking data types and using them to find patterns across massive amounts of data. Today, the dream is more threatened by the harm that personalized medicine could do if the data and insights it yields were improperly used". He concludes, "Block chain could be at the foundation of the solution, with the patient having ultimate control over their data and how it's used".

Halamka remains cautious however. He notes that technical challenges pose obstacles to the adoption of block chain initiatives in healthcare. "It's slow, it's awkward to use, the number of steps required to get and put data to block chain are numerous and complex". There is hope though. "There are emerging "block chain-as-a-service" products that attempt to solve these problems, but they are very early" observes Halamka.

Matthews and Cenaj note that, in addition to these technical challenges, there are significant cultural obstacles that stand in the way of block chain adoption as well. "Regulation, policy, and legacy practices hinder the US from assuming a leadership role. Shareholder value does not equal patient value. It may take 10-15 years unless policy changes are implemented rapidly", comments Cenaj. Matthews remarks, "Until we have a policy change at the highest levels of government, I don't think that block chain will be more than a point-solution for data security. I am convinced however that when we do finally have clarity on who owns patient data, transformation in personalized medicine could happen fast".

In spite of his pragmatism and caution, Halamka is optimistic about the future of block chain in healthcare. "There are production applications in healthcare using block chain now, and they will become more commonplace over the next year. Like any innovation, we'll go through a hype phase, a disappointment phase and eventually achieve broad adoption. Expect three years before there is universal adoption of block chain related products". If Halamka is correct, we could see block chain driving healthcare transformation sooner than expected.