Blockchain & smart contracts: The dawn of distributed health?

Alcimed, an innovation and new business consulting firm, presents the potential use and risk of the blockchain in healthcare.

July 21, 2016. What is the blockchain technology? Birthed as the technology behind Bitcoin's online payment system, a blockchain is a distributed ledger that holds an ever-expanding "chain" of data. It digitally connects users, uniquely allowing peers to transact in an online currency, or *cryptocurrency*. It enables hundreds of thousands of everyday transactions without the usual administrative, financial, and security barriers of processing so much data. As "blocks" of data are distributed among all its users, more data is irreversibly added and time-stamped with each transaction. The blockchain brings a new dimension to transparency, validation, and data storage.

Smart contracts, stored on the blockchain, will increase automation. A smart contract is the digitized execution of a contract (legally binding agreement), transparent on a blockchain. Far from implementing its maximum potential, smart contracts currently automate financial transactions because of the capacity to validate the owner and history of the currency. Still in its infancy, smart contracts may in the future, for example, handle mortgage payments, without having to go through a bank as a middle-man.

Blockchain and smart contracts can completely change the healthcare landscape: preventing errors in patient care, and automating transactions – from pharmaceutical inventories, down to home deliveries to patients.

Although still a long road ahead, academic institutions, corporations, and governments are already pushing for the blockchain revolution of healthcare. For example, the US Department of Health and Human Services this month has called for research submissions on blockchain applications for the industry.

One application is improving patient care through healthcare providers' ability to input and share patient records, for the validation of patient identity and health history. This can help avoid medical errors and prevent the entering of false information. This may also be directly linked to insurance information and automatic payments, with potentially lowered healthcare costs saved by the end to insurance fraud.

Another application is efficient and secure inventory management: monitoring and connecting inventory levels, and automating deliveries. Alcimed Project Manager in Princeton Antonin Dura provides an illustration: "A hospital running low on a certain drug can have a smart contract with a pharmaceutical company, which automatically sends it. This could be executed to the patient level in one's home, for example, for automatic deliveries of healthcare treatments." Among other benefits, such deliveries could assist patient adherence to their therapies. Drug data

stored on a blockchain further ensures the [drug authenticity and traceability](), especially with the rise of online pharmacies.

Alcimed sees automation in healthcare as ripe grounds for innovation, new business, and partnerships, if financial, legal, and regulatory cooperation can be found. Before implementing smart contracts, it is necessary carefully to weigh the risks against the added value of automation. This is to ensure that programs underlying smart contracts can withstand hacks, such as that recently seen in The Decentralized Autonomous Organization, whose funds were drained nearly one-third.

Are smart contract writers and policy-makers long-term thinkers, who can envision what has not yet been experienced? How will external events pose problems to smart contracts? Even if every event could be predicted, it is a challenge to write programs to respond accordingly. Apart from new laws and regulation, only the agreement to interoperability between a wide array of stakeholders will make smart contracts possible for healthcare. This includes the willingness to invest time and money into tests and trials of the still unfamiliar technology, ensuring a robust system before its widespread use in the industry.

About Alcimed

ALCIMED ([www.alcimed.com]()) is an innovation & new business consulting firm, specialized in life sciences (healthcare, biotech, agri-food), chemicals, materials, energy; as well as aeronautics, space & defence. ALCIMED relies on a team of 180 highly-skilled individuals to help its clients with exploring and developing their uncharted territories, covering four key areas: New Technologies, Market Innovation, High-Growth Geographies, and Strategic Foresight. ALCIMED is headquartered in Paris and has offices in Lyon & Toulouse in France, in Germany, Belgium, Switzerland, the UK, the USA and in Singapore.