BLOG
HIMSS Europe

What's happening in healthcare IT?

A Nordic way to blockchain in healthcare

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The healthcare market

Many reasons can be listed for motivating the intense worldwide debate currently ongoing on healthcare: it is indeed a huge market ($8.7 trillion in 2020, according to a recent report issued by Deloitte[1]), experiencing surging costs and facing difficult long-term sustainability of the overall system, also due to increasingly ageing societies, and plagued with various issues, like the worrying phenomenon of medical errors and health-related insurance frauds. To these long-standing open issues, new challenges are becoming more and more central, like making the health data available to citizens, enabling the data exchange from one healthcare provider to another, as well as understanding technological innovations and their potential impact on the future healthcare service provisions.

Last but not the least, recent events in personal data breaches encourage a re-evaluation of the data management/flow value chain, considering the introduction of more accurate risk-based approaches, as proposed in GDPR. In this sense, it could be advisable to embrace new emerging technologies such as blockchain to implement tools for a more secure and honest data stewardship.

Recent developments in Distributed Ledgers Technologies (DLTs) caused some technology-enthusiasts to make bold claims about the fact that DLTs were the panacea for all these issues, and everything in healthcare could have been fixed through this blocky version of the "magic wand": DLTs will solve the interoperability issues, will make it possible to reduce medical errors, reduce health insurances frauds, enable free data flow, give citizens full access and ownership of their data and reach a higher global standard.

Unfortunately, these claims contributed to the hype surrounding this novel and promising technology, without providing sufficient evidences and clear explanations regarding how DLTs will actually provide the technical means for achieving such goals.

Blockchain technology

It is true, though, that a significant number of initiatives are currently undergoing, trying to address some of the above-indicated issues, also managing to raise money through Initial Coin Offerings (or less innovative fundraising mechanisms).

In the European scenario, it is worth mentioning the MyHealthMyData project, funded by the EU under the H2020 research programme. MyHealthMyData (MHMD) aims at implementing one of the first blockchain-based biomedical information network centred on the connection between healthcare providers, biomedical industries and individuals, encouraging a more robust data flow, starting from hospitals making anonymised data available for research and development, while prompting citizens to regain control over their health data, through personal data accounts, at the same time providing robust tools for consent management and data access control. The ultimate vision of MHMD is laying the foundation of a multi-sided health data marketplace, based on new mechanisms of trust and direct, value-based relationships between EU citizens, hospitals, research centres and businesses.

If we remain in the European scenario, another initiative is worth being explored, both for the adopted approach and for the overall vision: CareChain.

CareChain is Swedish blockchain initiative, aiming at implementing a national blockchain for health data, also making it possible for citizens to regain control over their health data, and for managing their consent dynamically, and in compliance with the relevant GDPRs provisions.

What makes CareChain an interesting initiative, somehow different from others of similar nature, lays on some specific aspects, which are discussed in the following paragraphs.

Guaranteeing the flow of data - the Consortium approach

First, CareChain approach is making all the relevant national stakeholders cooperating in implementing a working blockchain solution, rather than providing a ready-to-use "one size fits all" technical architecture, CareChain is testing and incrementally refining its architecture through the collaboration with research centres, medical centres, public institutions, private companies, etc. The outcome of the process will be a blockchain architecture tested, approved, and usable, by all the relevant stakeholders, and ready to work in the given environment, without frictions or huge adoption-associated burdens.

This consortium-based approach also provides a very original and powerful way of making the overall architecture fully trusted, by making each member of the Consortium, i.e. independent organisation enjoying public trust, the ones responsible for the nodes entrusted of transactions verification. This approach provides the users of the system with additional guarantees of the trustworthiness, stability, and integrity of the network and of the data exchange process, at the same time solving the technical issues (such as scalability, high computational and energy requirements, etc.) associated with traditional consensus mechanism and verification systems (such as proof of work), also removing the need for mining.

A thriving services' market

Such an approach allows to avoid having several competing blockchain solutions and architectures in place, and rather focus on the implementation one solid solution involving all the stakeholders, thus reaching the objective of enabling an innovative healthcare framework - leveraging on the features offered by DLTs.

This leads to the second noteworthy peculiarity of CareChain: the vision of such an innovative framework, with an eye on services and tools that could be provided by private companies in this context, on which CareChain is building up a perspective business model. Indeed, once the full technology will be in place, the time will be mature for a flourishing new market, where different actors might provide added-value services on top of data and other digital assets.

Some examples include reputation and claims verification tools, certification of health-related application - in compliance with the relevant regulation and in view of guaranteeing highest quality to customer of a novel health-app marketplace - health apps themselves, providing citizens and patients with innovative ways to access, share, and use their health and health-related data (such as biometric data coming from wearable devices or IoMT), and even AI-powered services to be used for analysing data. Beside user-oriented tools, CareChain is also looking at services for other kind of stakeholders, like health insurance, and research centres dealing with clinical trials, envisioning specific services to be offered on the market once the general blockchain architecture will be in place.

Self-sovereign identity

Being a national initiative, backed also by public institutions, CareChain identified as a key priority to have a state-of-the-art tool for managing appropriately the identity of all the participants to the network. Having a non repudiable public identity is indeed a fundamental prerequisite for enabling lawful data exchange, accessing services, authorising transaction, and so forth.

For achieving such a result, CareChain is betting on the latest (and most interesting) trend in regard to digital identity: the self-sovereign identity, i.e. an identity completely owned and controlled by an individual or organization, without intermediation. To implement such a system, CareChain is building on top of novel open source standards (developed by the w3c and the decentralised identity foundation) and will implement the system also leveraging on the above-described consortium approach.

GDPR compliance

Last but not the least. CareChain also deals with GDPR. The relationship between GDPR and blockchain is somewhat controversial, whereas on one hand, blockchain seem to represent a good ally of the GDPR (when it comes to data portability, as an example, or consent management, data traceability and lawful access auditability), while on the other hand various issues can be identified (when it comes to right to be forgotten, but also when the technical implementation through smart contracts might weaken the actual control over data, through automatic execution). CareChain will provide a GDPR-compliant system for dynamic consent management, which is a very interesting implementation fully in line with the GDPR provision about consent (and relevant patient engagement). The approach will be submitted for formal verification by independent legal expertise with the aim to be approved by the Swedish Datainspektionen.

We are delighted to continue following the progress of CareChain's and other significant initiatives in the ecosystem, who are making great efforts to create a more transparent and secured data exchange world.

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[1] https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sci... (https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-2017-health-care-outlook-infographic.pdf)

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