

Health Matters

Technologies Driving Change in Healthcare, A Community of Thought

Blockchain and Healthcare Data *Current Applications*

Galia Kondova

School of Business FHNW Switzerland

Amala Arockia

School of Life Sciences FHNW Switzerland

Blockchain and Healthcare Data: Current Applications

By *Galia Kondova & Amala Arockia*

Healthcare records are increasingly becoming digitized. The electronic healthcare data exchange is being facilitated by standards such as the Fast Healthcare Interoperability Resources standard (FHIR) developed by Health Level Seven (HL7). The HL 7 FHIR standard has primarily been used among institutions within the healthcare system. However, the outbreak of the COVID-19 imposed the necessity to track and selectively share information on individual COVID-19 status outside the healthcare system, i.e., with non-healthcare organizations. Thus, new privacy-preserving solutions based on the blockchain technologies have been developed in order to facilitate personal health data exchange in a secure and privacy compliant manner (Kondova, 2021).

The privacy preserving blockchain-based solution of the IBM Digital Health Pass (IDHP) is presented in this article.

IBM Digital Health Pass (IDHP)

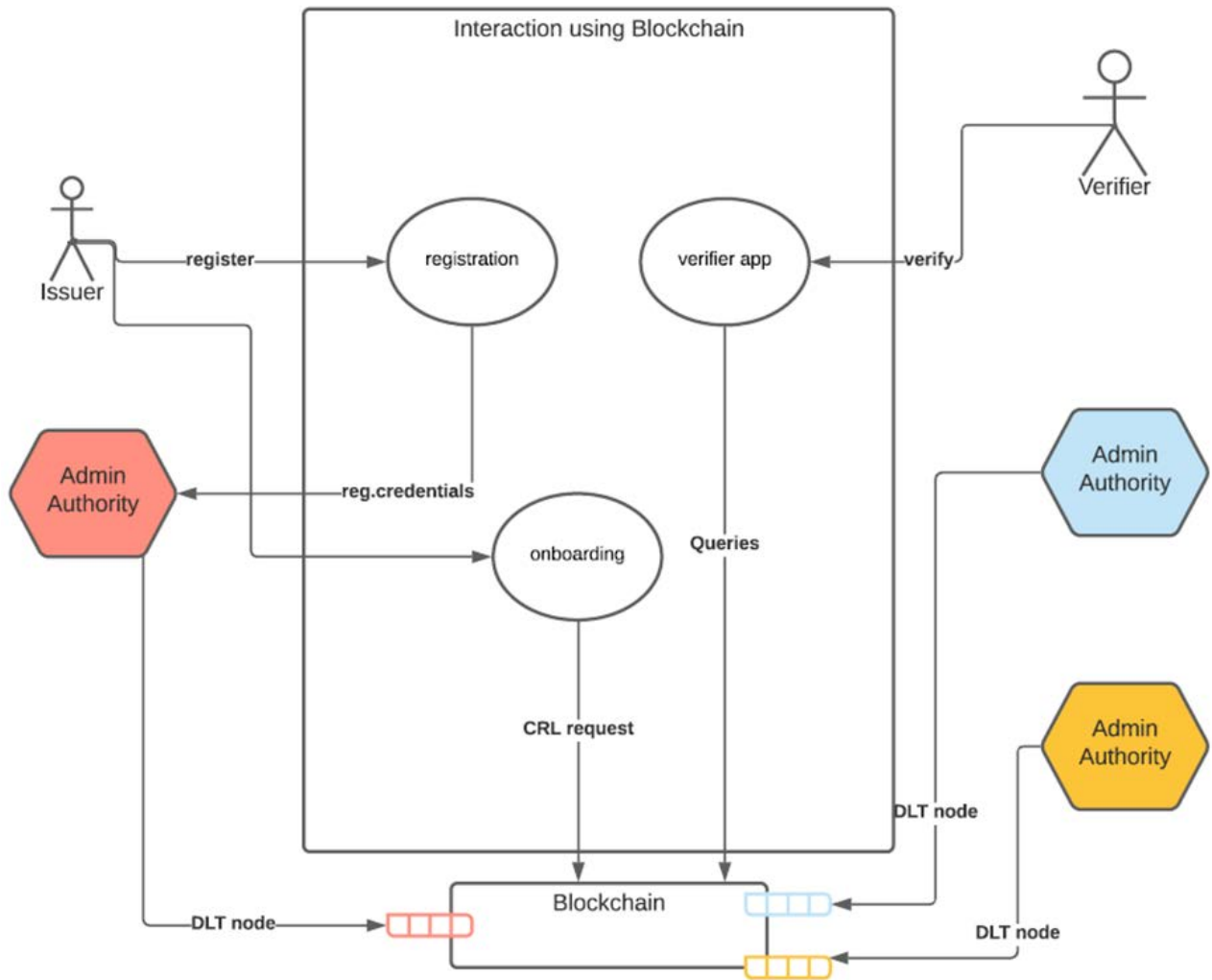
The IDHP is a blockchain-based system used to manage information travelling through the Digital Health Pass Ecosystem.

This ecosystem is structured in four distinct layers. The first layer is composed of the users themselves, namely, issuers of certificates, verifiers, and the holders of the certificates themselves. The function of the issuer is to provide health credentials to the respective individual such as test results or vaccination records. This personal healthcare data could be stored by the individuals in a digital wallet in the form of an app and presented as a QR code to the verifiers when needed. The verifiers could then check the validity of the presented credential only by scanning the QR code. This user-friendly interface represents the second layer of the digital health pass ecosystem.

The third layer called the API layer forms a system that exchanges information between the SDK and the trusted registry plus providing the users with micro-services such as possibilities to temporarily upload credentials to the cloud or the possibility to download user credential from an external database called the Postal Box.

The fourth layer of the digital health pass consists of the trusted registry based on the Hyperledger fabric blockchain where the Certificate Revocation List (CRL) and the metadata of the issuer is stored. The main feature of the IDHP trusted registry is its decentralized nature thus minimizing the risk of a single point of failure or data tampering (Androulaki et al., 2021). Figure 1 presents a use case diagram.

Figure 1. IDHP – Use case Diagram



References

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