

Abstract

The dissertation presents a novel concept of a secure and trusted electronic service (e-service) as a durable medium for processing and managing sensitive electronic documents. The developed e-service was further practically implemented in a real company. Due to the nature of this dissertation, the presented descriptions combine both: scientific and implementation aspects. Firstly, the current state of the art in the field of durable media was reviewed (regarding solutions presented in the literature, as well, as those available on the market). An analysis of legal aspects and a review of the applications of blockchain technology and a trusted third party were also analyzed.

Both scientific and developmental research were the basis for further implementation. Experimental verification of the implemented e-service was carried out, both in terms of the use of blockchain technology, as well, as selected algorithms and cryptographic methods applied in the designed e-service. The most important step of the implementation stage referred to the deployment of the developed e-service within the IT infrastructure of “Perceptus sp. z o. o.” – a company located in Zielona Góra, Poland. The results confirmed the correctness of the developed e-service. In particular, the compliance of the requirements (functional and technical) specified in the developed e-service model with the results obtained after its implementation was confirmed. This means that the designed and implemented e-service is secure (through the use of the blockchain network and cryptographic algorithms) and trusted (thanks to the role of a trusted third party played by “Perceptus sp. z o. o.” – the e-service provider).

Keywords: e-service, durable medium, blockchain, trusted third party