LIFELONG LEARNER MODELLING

Knowledge Lab

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Research Aims

This study puts forward the integration of learning experiences from all learning tools that a person interacts with during his whole life into a lifelong learner model. The aim is to design and develop a middleware infrastructure that will manage the interaction between the lifelong learner model and the applications, and to examine whether such an infrastructure can contribute towards the realisation of the personalised lifelong learning concept.

Methodology

We have developed a theoretical framework to model lifelong learners, which is underpinned by the Pedagogy-Andragogy-Heutagogy cumulative learning continuum, where lifelong learners progress in maturity and autonomy. The framework can record both online and offline learning activities and combine learners' information from diverse sources and from all types of learning settings (formal and informal) throughout life. It supports contemporary pedagogical approaches and builds on existing conceptual and process models for pedagogy-driven design of learning ecosystems.

Research Approach

Based on this framework, this research introduces a peer-to-peer method for storing and exchanging learner data with minimal trust. The proposed approach supports the Experience API standard and eliminates the need of a mediator authority by using distributed ledger technology. The proposed mechanism for storing and sharing lifelong learner data is depicted in **Figure 1**.

The current focus of our work is to develop an access control mechanism to protect learner data from unauthorized access. This issue of data confidentiality arises from the fact that all Ethereum transactions are public. In order to enable users' control over their data, a dedicated smart contract is used to store an Access Control List (ACL) for each block containing xAPI statements.

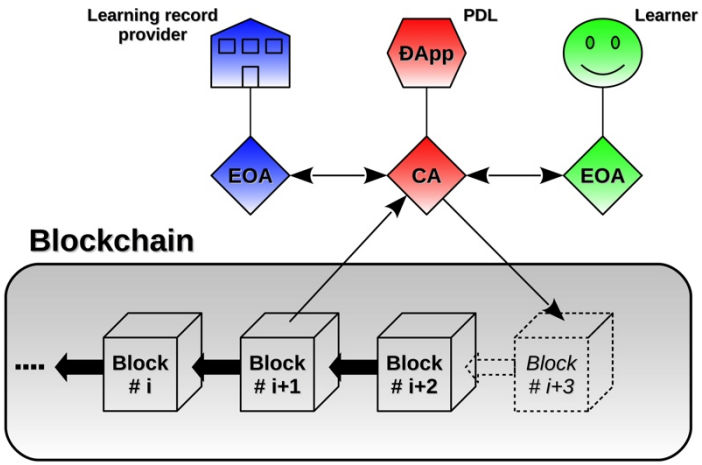

Figure 1. Mechanism for storing and sharing lifelong learner data

Publications

Karoudis, K., & Magoulas, G. D. (2019). User Model Interoperability in Education: Sharing Learner Data using the Experience API and Distributed Ledger Technology. In B. H. Khan, J. R. Corbeil, & M. E. Corbeil (Eds.), *Responsible Analytics and Data Mining in Education: Global Perspectives on Quality, Support, and Decision Making* (p. 292). New York: Routledge.

Karoudis, K., & Magoulas, G. D. (2017). An Architecture for Smart Lifelong Learning Design. In E. Popescu, Kinshuk, M. K. Khribi, R. Huang, M. Jemni, N.-S. Chen, & D. G. Sampson (Eds.), *Innovations in Smart Learning* (pp. 113–118). Singapore: Springer Singapore.

Karoudis, K., & Magoulas, G. D. (2016). Ubiquitous Learning Architecture to Enable Learning Path Design across the Cumulative Learning Continuum. *Informatics*, *3*(4), 19.