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Project Results

MOOC TAB

Tablet-based platform dedicated to lifelong learning

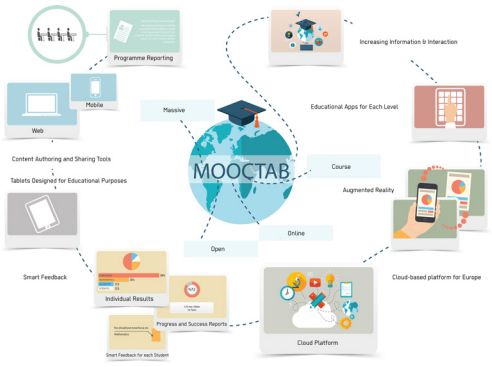
EXECUTIVE SUMMARY

The ITEA project MOOC TAB set out to develop the tools that could help boost the opportunities afforded by MOOC technology for lifelong learning at all levels of education and post-education. To ensure these tools would be equipped for the new generation eLearning landscape, the MOOC TAB project focused on two specific aspects: management and security.

PROJECT ORIGINS

As e-education systems expand worldwide (global market of USD 267 billion in 2017), a key component in this growth is the fast-emerging offer of MOOCs (Massive Open Online Courses) in the corporate HR and higher education segment. The success of MOOC is expected to change the structure of the higher and corporate education industry within 10 years as it opens up avenues for study and learning to potential students from all over the world. The tablet, as a tool for having content whenever you want, complements the online Web MOOC Platform. Nevertheless, such massive deployment within education pinpoints the need for both tablet fleet management and content management security.

The challenge undertaken by the ITEA MOOC TAB project, therefore, was to develop simple and effective identity management and security features, thereby realising twin goals: to facilitate access and ensure security of this access to the eLearning platform. First of all, the requirements had to be defined and analysed, taking account of the application scenarios, the detailed State of the Art, the interactions and the business models. The subsequent technology focus comprised three work packages that examined 1) the Cloud service platform technologies and the associated tablet firmware and applications, 2) the various content, assessment and community tools, and 3) security solutions, content protection and user authentication and privacy. Finally, the realisation phase concentrated on the MOOC TAB use cases – their definition and implementation, field trials specifications, demonstration and integration.



MOOC TAB business value chain

TECHNOLOGY APPLIED

The development of an on-demand MOOC platform is based on existing open source MOOC platforms. Data is stored on a local secured cloud and tablets with an intuitive interface and a secured connection are used. An open platform also means that other use cases can be added retrospectively.

With security and identity as the key challenges of the project, MOOC TAB generated several innovative technology results, including the first EAL7 evaluated NFC Student ID card that is compliant with the European eIDAS regulation and associated ANSSI standard. This ID card not only provides convenient and efficient access to MOOC applications via a single card but also allows new applications, in areas such as healthcare and payment, to be added to existing electronic ID cards after they are already deployed in the field. Furthermore, epub3 DRM (ebook file format) combined with an eIDAS authentication, protects highly confidential documents and courses when they are downloaded. Integration with NFC tablets along with a Trusted Execution Environment (TEE) for Android-based tablets on a single silicon boosts efficiency and reduces the number of components needed (bill-of-material). Two demonstrations, one home-based and one in the examination room, showed the effectiveness of this integrated solution whereby a wearable bracelet containing the ID data of the wearer and the MOOCBox, the NFC secure reader hardware prototype developed specifically to demonstrate the MOOC tablet application, match and thus allow access to the Cloud-stored data in a secured ID access transaction.

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Additional to the application, an auxiliary learning map, or easy-to-use editor, was developed to enable every learning manager to model a domain of skills. The method applied to browse the offer of a training centre, for example, with a "how-to-add-skills-to-my-CV" approach rather than an ordinary catalogue of linear courses, is an innovative feature of the project that is not available among the eLearning solutions already on the market.

Finally, the project enabled the development of a highly integrated component that merged on the same device both the identification features via the NFC capability and the security feature via the secure element. These two features are key for MOOC deployment.

MAKING THE DIFFERENCE

The applications deriving from the results of the MOOC TAB project include integration in school management systems and a virtual lab feature that is packaged with the software needed for practical assignments during courses. This feature offers a learning-by-doing experience for professional training that results in more engaged learners. A virtual training room (virtual classroom/webinar) for synchronous sessions with learners adds social live interaction to improve the impact of courses, and allows teachers to easily check the level of understanding. Immanens has demonstrated these virtual environments in its SPOC PRO (Small Private Online Courses digital environment) technology trial and has begun offering SPOC PRO in its new line of business on eLearning along with a delivery system it is developing with multiple DRM for E-books.

The results achieved on the security front are being integrated in eID for the government and education market, with the eIDAS embedded software platform and server side also being reused in the corporate ID and mobile ID market. In terms of the hardware components, the NFC and eSE combination can be used in the tablet market and the user identification application reused in IoT markets. Pilots to target education projects are under way in Turkey – two in Bahcesehir Colleges / Ugur School, the other in Bahcesehir University for teachers and students – and in classrooms in Brittany, France. In addition, the generic nature of the platform creates possibilities for the teacher to access wiki-data and, using key search words, quickly create tests for students based on their learning from the same sources.

MAJOR PROJECT OUTCOMES

Dissemination

- More than 10 publications targeting standard bodies (e.g. IDPF, W3C, ECMA, NFC forum, AFNOR, ANSSI)
- Two main presentations of the MOOCTAB platform in a French and in a Turkish university

Exploitation (so far)

- NFC Controller to establish a contactless communication and Embedded Secure Element to encrypt / decrypt data
- Content creation tool: generic module for course content creation/editing and enrichment with adaptability of popular learning management systems and education standards
- SPOC Pro: Learning Management System with enhanced experience for professionals
- eID OS for secure documents: eID application enabling electronic Identification and Digital Signature compliant with the latest version of international standards with Match-On-Card application enabling biometric finger print verification
- OpenEdX database synchroniser: synchronisation of databases between a central OpenEdX server and a local OpenEdX server
- TopicQuiz: automatic MCQ (Multiple Choice Question) generator
- Trusted Execution Environment (TEE) activation: ensures integrity of trusted applications along with confidentiality of their assets
- Virtual Lab: a virtual machine packaged with software needed for practical works during courses
- Studio: video transcription, workflow for usage of Google Drive as a Digital Assets Management for courses contributors, PDF to LMS converter
- VideoSecure: light Digital Right Management on video streaming for content protection
- Offline courses: the platform delivers the courses as Epub files for a complete mobile learning experience

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Project start
January 2015

Project end
June 2018

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