Interoperability Issues for Formal Authoring Processes, Community Efforts, and the Creation of Mashup PLE

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Abstract. This paper compares three different scenarios towards the creation of learning offers and looks at corresponding interoperability issues involved. In outlining use cases that demonstrate three possible authoring/learning scenarios, restrictive and supporting aspects become obvious and eventually lead to the deduction of prerequisites and requirements that are vital for the setting up of an effective (personal) learning environment.

Keywords: interoperability, content creation process, personal learning environments

1 Introduction

In professional formal learning media production, standardised process models and interoperability standards are the results of the trade-of between creative collaboration and organisational quality requirements.

Web 2.0 communities as well as efforts towards open educational resources are built around the notion of voluntary, free and open collaboration. Interoperability issues arise when different communities meet. However, in PLE research, little has been said about collaboration and interoperation issues despite a strong trend towards the notion of personal learning environments as personalized and individualized instruments [5].

In a previous workshop [3], we compared for three different settings the content creation process and the possible outcome in regard to learning possibilities and interoperability issues. Therefore three different groups had to work on the same task (to collaboratively create an opportunity for learning a language) using different approaches (formal authoring of content, community approach, setting up a PLE). With this paper, we want to present some results of that workshop.

2 Setting up content

Formal content production processes, community based Web 2.0 offers and the creation of mashup PLEs represent three different approaches to produce units of learning in the sense of a contextualized, self-contained unit of education or training, such as a concrete course, module or lesson.

2.1 Creating content with a formal authoring tool

Setting up a learning offer with a formal authoring tool very often refers to scenarios in which professional authors collaboratively create content i.e. units of learning. They collaborate in order to optimize the result by exchanging information and knowledge. Collaborative authoring implies simultaneous (real-time) and asynchronous collaboration. Authors and learners are distinct groups.

This scenario is usually applied in formal learning settings by companies, educational institutions, etc. Content delivered is usually considered to be "final" or "approved".

Authoring tools are commonly used to produce learning content for a defined learning target, a specific learning group, etc. The content has a defined scope and extent. Its creation and delivery follows a formal mostly standardised process.

To produce learning content, authoring tools have to be interoperable along the production chain. Most authoring systems support certain standards like SCORM [6], LOM [7], AICC [8], IMS LD [9], IMS QTI [10], etc. Content set up according to these standards runs on all systems supporting these standards.

2.2 Content creation with community based Web2.0 Tools

Creating content with a community based Web2.0 tool means creating materials and providing tools for learning and also arranging them in a learning environment that encourages individual and social activities.

Creating a learning community content does not mainly focus on informing or imparting knowledge but also serves as a starting point for individual reflections as well as discussions with others. It is "alive" and changes rapidly according to community requirements. Members/learners contribute as well as consume.

The content creation process and accordingly the content itself do not necessarily meet formal (learning) requirements. Social software systems are mostly self-organized and characterized by communication and collaboration. Therefore they especially suit phases of informal learning [11].

Still, this scenario involves the notion of content as a medium given from the collaborative authoring team to the community of learners (which may overlap) and different phases of its creation may be distinguished. Also, when setting up content, interoperability issues regarding the use of tools, platforms, etc. arise and have been addressed with standards and initiatives like OpenId [12], OpenSocial [13], or OAI [14].

2.3 "Authoring" a mashup PLE

A mashup or widget/gadget environment as part of a Personal Learning Environment takes into consideration all different sorts of learning activities (web-based and non web-based). As an individual setting it is created on a widget platform according to one's own needs and can serve different purposes such as information, learning, gaming, etc.

To create a mashup learning environment it is necessary to collect and choose available and suitable widgets as well as different tools for communicating. No formal (learning) requirements restrict the choice; no quality assurance/control is applied except for the personal assessment of suitability.

This scenario does not involve a distinction of authoring team and learning community: the author (or creator) of the PLE does it for his/her own purpose. Consequently, a PLE is not primarily about content, but rather about tools, services, and resources. In this context interoperability issues between the different components of the PLE arise [4]. As a result to this, widget standards (W3C widget Requirements, Open Ajax Alliance's Gadget) emerge in order to drive interoperability. However, standards that reflect learning needs in widget environments are still missing.

3 Conclusion

Table 1 compares the scenarios concerning collaboration issues, interoperability focus, standards and summarises the key settings for each approach in the conclusion.

	Formal authoring tool	**Community based Web2.0**	**Mashup PLE**
Collaboration	Formally defined processes and roles, collaboration takes place along production process	Self-forming teams, dynamic collaboration by volunteers	Learners may communicate on efficient and effective constituents of a PLE
Interoperability	Between Content and Learning Environment	Ease cross community work	Between components of the PLE
Standards	Well-defined standards available (SCORM, AICC, IMS LD)	Standards emerge (openID, OpenSocial, OAI)	Interoperability issues not yet systematically researched
Conclusion	Collaboration is an efficiency factor supported by interoperability standards along the production chain. However, this setting does not leave much room for individual adaptation.	Collaboration is a key success factor. Interoperability standards ease cross community work but are not required. However, interoperability standards also paved parts of the way towards mashup PLE.	Collaboration is an add-on feature in PLE. Key benefits (highly tailored to individual needs) come with loss of interoperability, comparability and clear collaboration facilitites. Responsibility is clearly given to the learner

Table 1. Comparing the three scenarios according to collaboration issues and interoperability issues

With the shift from traditional and formal authoring processes and content delivery scenarios towards community driven models and personal learning environments [2], new interoperability issues arise. In the classical scenario, interoperability issues are addressed by standards that last but not least enable the tracking of learner data and assessment results, which is of importance to many who work with it. In the community scenario, interoperability issues gain importance in order to ease cross community work.

With respect to mashup PLEs, the term interoperability mainly refers to the interplay between components of the PLE: how can different widgets interoperate, while the scenario remains technically simple and open for personal adaptations [4]? However, little is said about the interoperability between PLEs of different users. How to exchange or compare results? How to measure quality, effectiveness or efficiency of highly individualized PLEs? These issues are open to further research.

Acknowledgments. This work is funded by the eContentPlus Programme of the European Commission through the ICOPER project.

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