Chapter 6

Developing Metadata Application Profiles for Open Educational Resources Federated Repositories:
The Case of the Open Discovery Space Metadata Application Profile

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ABSTRACT

With many Learning Object Repositories (LORs) implemented and maintained independently from different organizations or communities, valuable Learning Objects (LOs) are scattered over different LORs and making it difficult for end-users (namely, instructional designers, teachers and students) to easily find and access them. A suggested solution towards addressing this issue is to create federated LORs, which aim to harvest and aggregate LOs' metadata from different LORs towards facilitating LOs' discovery across these LORs through a single infrastructure. However, a challenging issue during the development of federated LORs is the design of appropriate metadata application profile (AP) which supports harvesting heterogeneous

metadata records from the aggregated LORs. Thus, the aim of this book chapter is twofold, namely (a) to present a methodology for developing metadata APs that can be used in building federated LORs and (b) to present a case study from the implementation of the proposed methodology for the development of the metadata AP used by the OpenDiscoverySpace federated LOR.

INTRODUCTION

Opening up education is an emerging and global movement that aims to facilitate innovative and flexible ways of learning and teaching by exploring the potential of ICT (Conole, 2013; Iiyoshi & Kumar, 2008). Open educational resources (OERs) have been attributed as a key element of the opening up education movement (The William and Flora Hewlett Foundation, 2013; UNESCO, 2012) and several OER initiatives have been developed worldwide by large organizations/institutions such as UNESCO OER Community (UNESCO, 2012), Open Education Europa, Carnegie Mellon Open Learning Initiative, MIT's OpenCourseWare (OCW), Stanford's iTunes and Rice University's Connexions or by communities/ consortia such as MERLOT and OER Commons (Zervas et al., 2014a). The main aim of such initiatives is to support the process of organizing, classifying, storing and sharing OERs in the form of Learning Objects (LOs) and their associated metadata in web-based repositories which are referred to as Learning Object Repositories (LORs) (McGreal, 2008).

These efforts have led to the development and operation of a rich variety of LORs hosting collections of LOs for different subject domains, educational levels, as well as languages (Zervas et al., 2014b; Ehlers, 2011). A key factor, in order to facilitate access to

(and efficient retrieval of) these LOs, is by incorporating appropriate educational metadata associated with them. For this purpose, existing LORs are using widely accepted metadata specifications such as ISO MLR (ISO/IEC, 2011), LRMI (Barker & Campbell, 2014), IEEE LOM (IEEE LTSC, 2005), Dublin Core (Dublin Core, 2004) or application profiles of these specifications that have been developed to accommodate specific needs such as characterizing LOs that address specific subject areas (i.e. science education, business education etc.) or different grade levels (i.e. school education, higher education, vocational training etc.) (Sampson et al., 2012).

On the other hand, with many LORs implemented and maintained independently from different organizations and/or communities/consortia, valuable LOs are scattered over different LORs and it is difficult for end-users (namely, instructional designers, teachers and students) to easily find and access them (Klerkx et al., 2010). A suggested solution towards addressing this issue is to create federated LORs, which aim to harvest and aggregate LOs' metadata from different LORs towards facilitat-

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