SWISS (INTER-)NATIONAL LEARNING OBJECT REPOSITORY

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Introduction

During the years 2000-2007 the Swiss national programme Swiss Virtual Campus (SVC), promoting learning over the Internet at the Swiss institutions of higher education (cantonal universities, universities of applied sciences, Swiss Federal Institutes of Technology), has subsidized a few dozen projects with a substantial amount of money. In a first phase from 2000-2003, the objective of the „impulse programme“ was to establish and promote expertise in the development and use of Internet-based interactive online learning units at institutions of higher education. During the second phase of the SVC programme, from 2004-2007, the objective of the „consolidation programme“ involves four main aspects:

- Establishment of e-learning “competence, service and production centres” at each institution of higher education
- Use and maintenance of projects developed
- New course development
- Services for universities and coordination

Learning Object Repository Background

By the end of 2005, a task force of the SVC has elaborated a business case for e-learning platforms in Switzerland after 2007, when the SVC programmes will come to an end. The task force recommends to centrally host two professionally supported platforms, one based on commercial software and one on open source software. The rectors’ conferences of all Swiss universities endorse the task force’s recommendations. Following this business case SWITCH, the Swiss education and research network, has tackled the evaluation of an open source platform under the auspices of the SVC.

Four working groups consisting of higher education e-learning experts have agreed to develop a list of requirements and features for a new e-learning platform based on open source software. They have agreed that, for various reasons, an additional nationally hosted learning management system (LMS) is not required. However, SWITCH/SVC were asked to develop a concept and implementation planning for a national learning object repository (LOR).

In autumn 2006 tests were accomplished to investigate the feasibility of LMS - LOR integrations with the following results: Common open source LMS can be easily extended with functions to export modules and/or entire courses to a repository, and the integration into existing SWITCH services, AAI [4] in particular, was shown to be easily possible. Blackboard based courses, however, can’t be integrated because of proprietary content formats and missing APIs.

Based on a poll of the future users, a pilot LOR Federation with three partners, including SWITCH, will be made available in summer 2007. During the second half of 2007, the most important features will be implemented and tested with the pilot partner. The regular LOR

service open to all Swiss institutions of higher education is expected to become operational in 2008.

Goals of a National E-Learning Repository

E-Learning projects like the SVC and numerous local initiatives at Swiss higher education institutions were successful in the sense that a broad range of academic teachers began to use the new technologies in their courses. In general, the production of digital learning content is increasing and will continue to do so.

Although a national LMS is available for all higher education institutions, many different platforms are used to produce and distribute e-learning courses. The federal culture in Switzerland permits universities, faculties and even professors to set up and use their preferred e-learning infrastructure. This leads to the situation that digital contents may be distributed over a heterogeneous collection of institutional LMS, but also over official or local CMS or even personal web pages.

The problem is obvious: as e-learning contents are dispersed over countless distribution platforms, it is virtually impossible to systematically search and retrieve learning objects in order to reuse them. If they are stored in LMS or local CMS they are usually only available to classes or a restricted group of persons. And finally, digital courses and learning objects are not stored in a persistent way, which makes it impossible to safely refer to them in citations.

The higher education community therefore suggested to establish a learning object repository (LOR) at a national level. The most important goal of a LOR is to empower the Swiss higher education community to share and reuse digital learning content, e-learning courses and other didactical material. A LOR makes teaching activities visible to peers and students and therefore creates the potential for intra- and inter-institutional collaboration. Finally, a repository allows for long-term archiving of learning objects, making them persistent and referenceable.

Repository Features and Architecture

The development of the national LOR is guided by experts of the Swiss higher education e-learning community. Based on their experiences a key requirement is ease of use. Content contributors should be able to transfer courses and learning objects to the LOR with minimal interaction. Ideally, in a well-configured environment, a course in an LMS can be submitted to the LOR with just one mouse click. Likewise, retrieving learning objects is intuitive using full-text or metadata search. Complex learning objects like courses or modules can be directly previewed online [Fig 1]. This offers the possibility to take a decision about the usefulness of a module without having to download and deploy it locally.

The community has requested to apply a metadata model that is as simple as possible. Firstly, due to limited resources, there will be no professionals or librarians who add metadata to LOR entries. Secondly, no teacher will be motivated or have the time to fill in lengthy forms for metadata. As in similar initiatives [1] there is a strong consensus that the number of mandatory metadata items must be kept as small as possible. Yet, in order to support a wide range of applications, the metadata model is extensible. The task of gathering metadata can also be simplified by using contextual information, e.g. the user name from login session data or a didactical description from the LMS where a learning object originates.

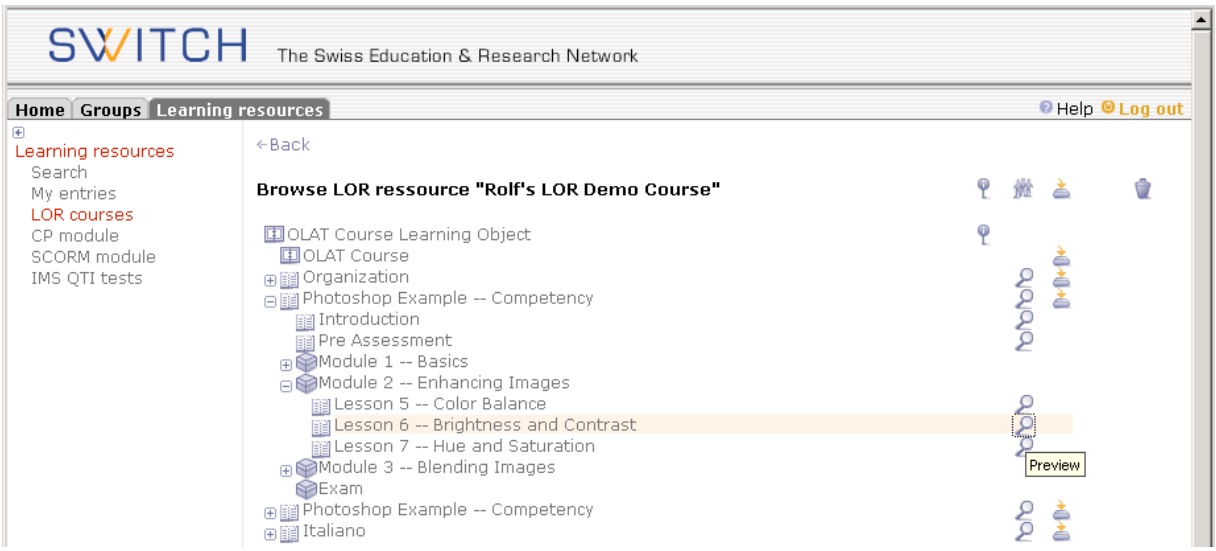

Fig 1: Online preview of an IMS Content Package.

Integration of the repository with existing infrastructure is another key requirement. On the one hand, the LOR is tightly integrated with LMS that are being used in Swiss higher education institutions. Currently, the most popular products are Moodle, OLAT, Ilias, Claroline and Blackboard. Existing courses or learning objects used in these LMS (except for Blackboard) can be directly transferred to the LOR with minimal interaction. On the other hand, it is straightforward to integrate search and browse dialogs to retrieve learning objects in any web site, like LMS, common CMS or educational portals.

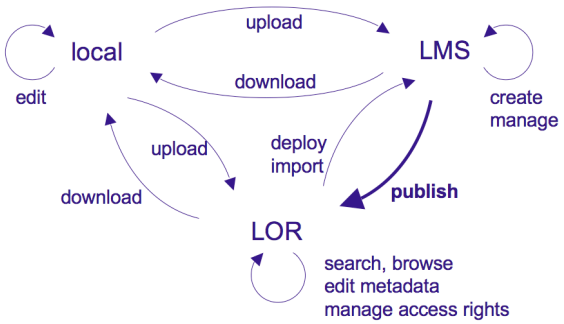

Fig 2: Content workflows and LMS-LOR integration.

A federated LOR architecture is envisaged to achieve a compromise between customizability, independence and interoperability. Contents are stored locally at institutional LOR systems whereas metadata harvesting and distributed search provide a mechanism to retrieve learning objects as if they were stored in a centralized system [Fig 3]. The existing and well-established open source repositories *Fedora* and *DSpace* are very promising candidates because they are used in similar contexts by many organizations and already have out-of-the-box federated search capabilities following the OAI-PMH standard.

Along with the federated architecture goes the possibility to customize the user interface. Institutions can provide an adapted interface to their users, in accordance with the local corporate identity. Furthermore, domain- or media-specific interfaces can be implemented to support special applications or enforce workflows. Interface flexibility can be achieved by strictly separating the basic repository engine from the presentation layer.

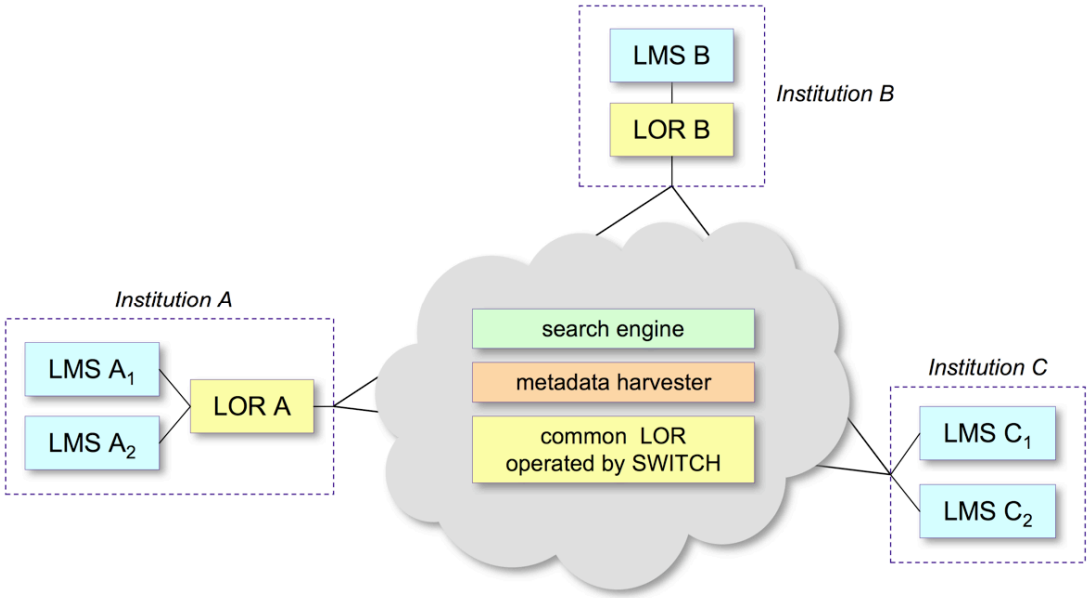

Fig 3: Federated LOR architecture

To motivate academics to make publicly available and share their digital contents they must have full control over the type of reuse. If contents are public, custom usage licenses like creative commons [2] or a similar usage policy is attached. Although it is not the main purpose of the LOR, non-public or restricted access is allowed in special situations, too. For various reasons teachers may decide to restrict reuse or access to members of their institution or to a self-defined group. As almost all Swiss higher education institutions are member of the SWITCHaai Federation, an authentication and authorization infrastructure based on Shibboleth [3], a straightforward method is on hand to realize efficient access control mechanisms.

First experiences in this LOR project are very promising. With regard to comparable projects it can be expected that the technical implementation is not the most demanding part. The biggest challenge will be to motivate content producers to actively contibute contents, and to get an emerging community benefiting from the reusable contents. Feedbacks from the community give a clear indication that a pradigm shift is currently taking place and that academic institutions are increasingly publicizing their intellectual assets in open access initiatives. We are convinced that the current period is an excellent time for the realization of public learning object repositories.

References

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