

Learning Objects Repository (LOR): Feasibility Project

Context

Build a content repository that allows sharing and searching of electronic educational resources on a national platform. A main target is to build a lightweight and easy to use system.

Presently, there are only a few solutions available that integrate LMS with open-source repository systems. In order to get significant evaluation results, prototypes have to be developed that integrate the most popular LMS (Olat, Moodle, Vista) with currently available open-source repository systems (Dspace, Door, Fedora, EPrints, WebDAV, Subversion).

Project Goals

- Prove technical feasibility: Show, that it is possible extract courses of a LMS along with their metadata and transfer them to a repository – all that with minimal user interaction.
- Illustrate integration possibilities: It is the aim to explore, prove and illustrate what developments are possible. In particular, it should be illustrated, who easy it can be to work with the system from the perspective of a course author.
- Code quality: This is a feasibility study, and the developed code will not be used in a production system. Code re-usage is not required. If promising, it is desired to explore unorthodox approaches.

Functional Requirements for Repository

Mandatory:

- simple, easy to use system!
- directly publish content files from LMS to LOR
- manually upload content to LOR
- manually download content from LOR
- basic access rights management

Optional:

- directly import content from LOR to LMS
- reviewing system, LO popularity meter, “users who used this LO also downloaded these LOs...”
- content harvesting
- federated search

Definitions

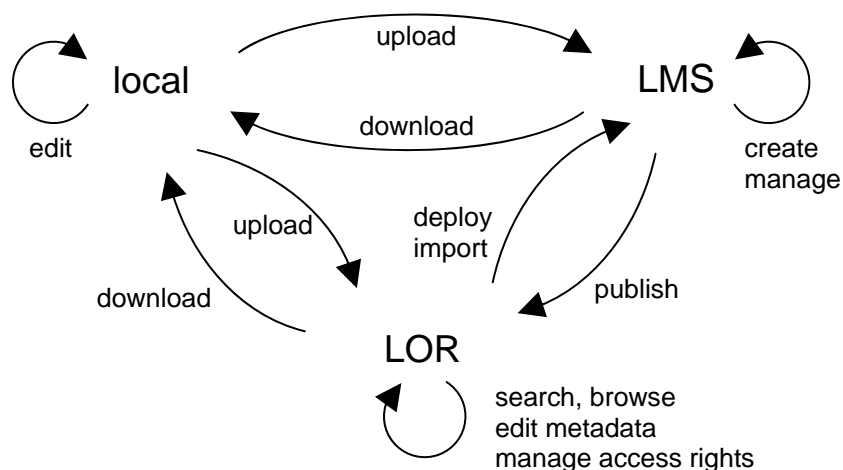
Learning objects

Type	Granularity	Content Formats
Course	1 semester, multiple related lessons	<ul style="list-style-type: none">• Proprietary LMS course archive• IMS-CP
Module Complex object	1 lesson or activity, ~15-45 minutes study time, package of related files	<ul style="list-style-type: none">• IMS-CP• SCORM• zip, ...
File	single file that can be directly (re-)used	<ul style="list-style-type: none">• html, css, pdf, doc, ppt, jpg, png, mp3, mpeg, swf, ...

Quizz	Questions of a course or module	• IMS-QTI
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Actions and Workflow

In a common setup without LOR locally created content (files) can be uploaded to the LMS where it is integrated into a course. Inversely, content files can be downloaded from the LMS in order to re-use or modify them on the local computer.

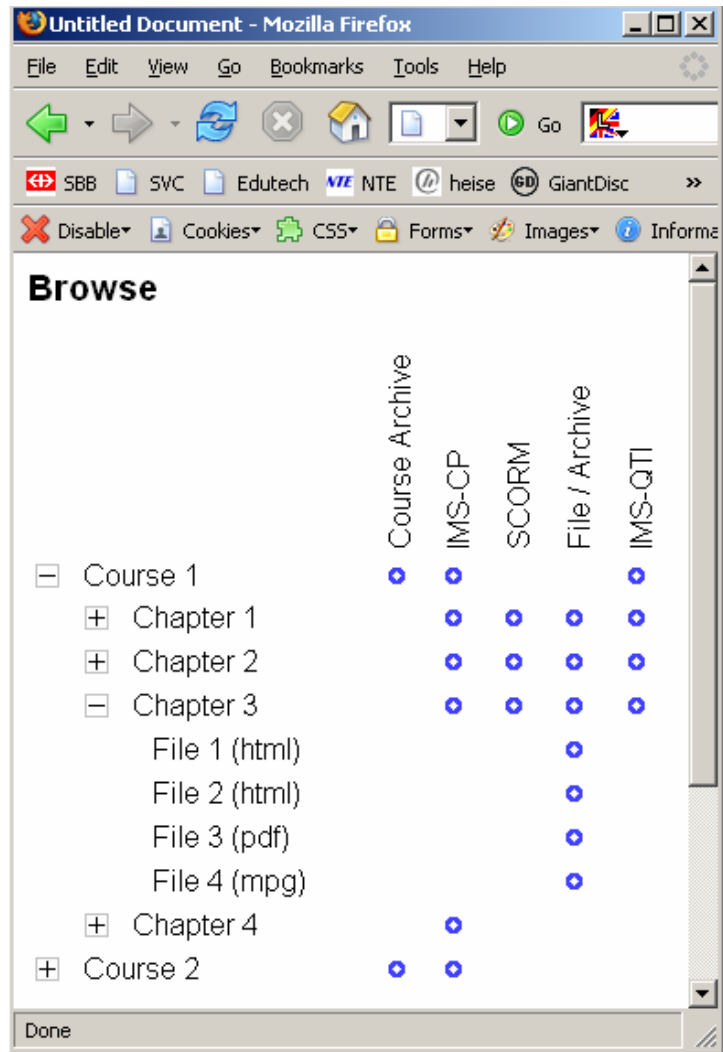


The classical approach with LOR adds the possibility to *upload* content to the repository to make it publicly available, and to *download* it for reuse. Metadata are manually added in a web-interface. The experience has shown that simple http up-/download of files and manual addition of metadata can be cumbersome, and may lead to general lack of acceptance or rejection by the users.

These problems can be avoided by an direct integration of the LOR with the LMS. A course author who is still primarily working in the LMS can directly make a course and it's components available in the LOR by *publishing* it. The publish action, invoked by a single mouse click, transfers the content and automatically adds the most important metadata (title, author/owner, category, course context). The author can modify and complete the generated metadata later.

Action	Description
publish	<p>Transfer entire course from LMS to Repository. This includes:</p> <ul style="list-style-type: none"> • Course archive • Modules (IMS-CP, SCORM, zip) • Files • Quizzes <p>The course transferred to the LOR with a simple command (i.e. a single mouse click), that requires no or minimalistic user interaction. The transfer at least includes an entire course (i.e. backup archive) and the individual files. If the LMS supports the notions of activities, modules, lessons or quizzes, they are automatically packaged as IMS, SCORM or zip archives and transferred to the LOR too.</p> <p>As much Metadata as possible is automatically extracted from the LMS and associated to newly created items in the LOR.</p>

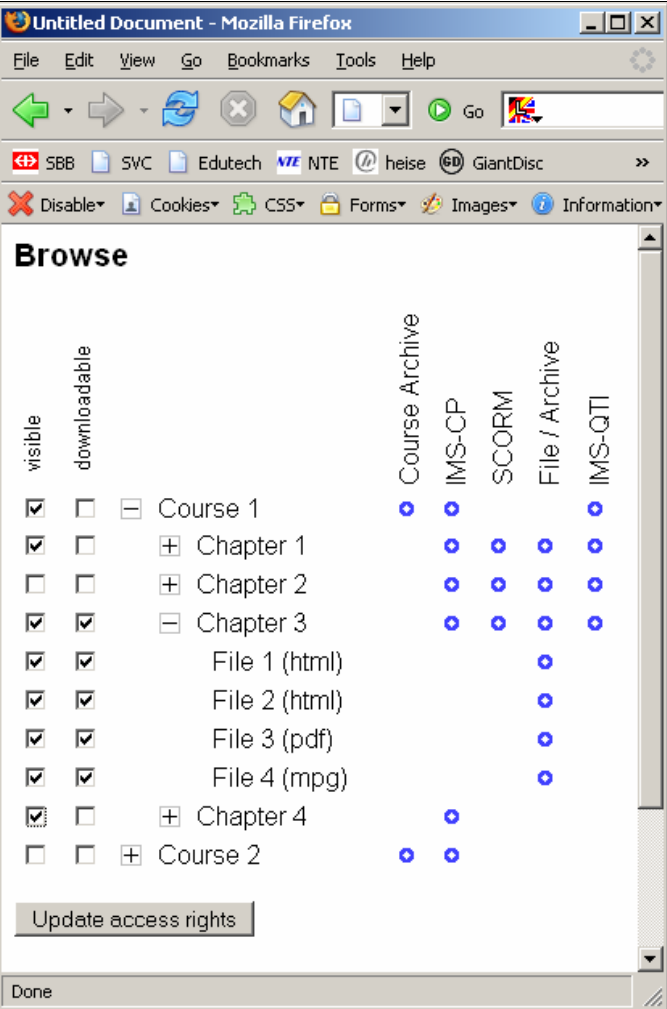
download from lms	Transfer specific item to local computer
deploy / import	<p>Transfer a specific item to a course in a LMS</p> <ul style="list-style-type: none"> • entire course: create an entire course (incompatible LMS? transform or re-package on-the-fly?) • module (make SCORM/IMS-CP module automatically available as lesson in a LMS) • file (copy file to LMS file store to make it manually available courses) <p>The direct import feature is a tricky one, and may not be easy to realize in this feasibility study.</p>
Search	<p>Search engine:</p> <ol style="list-style-type: none"> 1. search by metadata (subset of ims-metadata) <ul style="list-style-type: none"> • title, language • author, owner • textual description of content • catalog, domain • self-defined / pre-defined keywords • version • status (draft, final, revised) • rights: cost, copyright • ... 2. search by content <ul style="list-style-type: none"> • full text search • filenames
Browse	<p>Browsing is supported at different levels:</p> <ul style="list-style-type: none"> • browse for courses within the entire LOR or a single institution • browse for learning objects within a course <p>Browsing for objects in a course directly displays all objects, that were automatically generated during the publish action. Different LMS may implement the publication of different sets of learning objects, depending on what granularity levels are supported by the LMS.</p>



Manage access rights for

- self-defined group
- world

- User roles are: author, owner, group (self-defined list of users, i.e. department members), world (anybody without authentication)
- Access rights can be defined individually for each learning object at any granularity level.
- The roles 'world' and 'group' can have different sets of access rights
- Access rights are set by the authors or owners of a course.
- Authors can invite new authors and give them writing access.
- User authentication is based on AAI.

		
<p>Upload to LOR Download from LOR</p>	<p>The system should support more than just http upload and http download. Access should be as simple as possible and allow integration with desktop file managers. Protocol be considered: WebDAV.</p>	

Integration LMS – LOR

LORs to be considered:

- GNU EPrints <http://www.eprints.org/> (functionality, documentation, community)
- Fedora <http://www.fedora.info/> (clean architecture, documentation, acitivity)
- Dspace <http://www.dspace.org/> (architecture, community)
- DOOR <http://door.sourceforge.net/> (simple, developers in CH)

Integration LMS – file versioning system / online file store

online file storage systems to be considered:

- subversion
- WebDAV

Aspects to be considered / decided

- how to avoid re-usage cycles? A popular LO is re-used several times, and the new instances will be in the repository again. A search will find all LOs. How can the original be identified?
- what happens, if a course is published several times? overwrite old the course, or create a new instance in a version history?
- system can also be used as long term archive for any kind of document?

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