Building and Integrating OpenSyllabus in Sakai

Yvette Lapa Dessap, Developer, HEC Montréal
Martin Montminy, Functional analyst, HEC Montréal
Rémi Saïas, Developer / ScrumMaster, HEC Montréal
Presentation Plan

• What is OpenSyllabus?
• OpenSyllabus Architecture
• OpenSyllabus in Sakai
  • Integration with Sakai’s Resources, Citations and Assignment
  • Integration with Sakai’s Course Management and Academic System
• Process and tools used to build OpenSyllabus (if time permits)
Presentation Plan

- What is OpenSyllabus?
- OpenSyllabus Architecture
- OpenSyllabus in Sakai
  - Integration with Sakai’s Resources, Citations and Assignment
  - Integration with Sakai’s Course Management and Academic System
- Process and tools used to build OpenSyllabus (if time permits)
Who we are and where we’re coming from

• The team
  • 8 developers (Variable: 4-6 FTE)
  • Scrum managed (Agile methodology):
    • Product Owner, Steering Committee, Stakeholders
    • Sprints: 4 week iterations with Planning/Demo/Retrospective

• ZoneCours
  • XML, model-based and Java
  • User success
  • Technical/legal limitations

• OpenSyllabus and Sakai
What is OpenSyllabus

• Successor of ZoneCours
• Structured Course Outline (or Syllabus) Editor
• Integrated into Sakai environment and works with other Sakai tools
• Collaboration tool:
  • Between teachers and students
  • Between teachers
  • Within the institution: registrar, department, library.
OpenSyllabus in Sakai – Big Picture

- Assignment
- Resources
- Course Management
- Citations
- More to come...

Institution Academic System
- List of courses
- List of sections
- List of students
- Schedule
- Location
- ...

OpenSyllabus

July 2009 10th Sakai Conference - Boston, MA, U.S.A.
Demonstration

• Purpose
  • Illustrate concepts presented later on

• Scope
  • User Interface, Text Editing
  • Resources, Citations, Assignment

• More details this afternoon
  • 2 Sessions at 3:15 and 4:00
• What is OpenSyllabus?

• OpenSyllabus Architecture

• OpenSyllabus in Sakai
  • Integration with Sakai resources, Citation and Assignment
  • Integration with Sakai’s Course Management and Academic System

• Process and tools used to build OpenSyllabus (if time permits)
OpenSyllabus in Sakai – Big Picture

- Assignment
- Resources
- Course Management
- Citations
- More to come...

Institution Academic System
- List of courses
- List of sections
- List of students
- Schedule
- Location
- ...

OpenSyllabus Architecture

- Model-based application
- Configuration in OpenSyllabus
- Google Web Toolkit
- Architecture Diagram
- Hierarchical Course Outlines
Model-based Sakai Tool

- OSYL course outlines are:
  - Based on a conceptual/abstract model
  - Implemented in XML
  - Validated against an XML Schema (XSD)

- Benefits of being model-based:
  - Adds semantic to content
  - Ensures semantic uniformity and coherence across course outlines
  - Ensures easy evolution, transformation, interoperability (within Sakai and outside)
  - Allows production of statistics, report and other data analysis
Model-based Sakai Tool

• OSYL model features:
  • Adds semantic to content
  • Is configurable and extensible
  • Allows a large degree of freedom in the structure of the course outline
  • Is decoupled from the presentation layer
The Syllabus Structure Model
Open Syllabus
OpenSyllabus Architecture

- Model-based application
- Configuration in OpenSyllabus
  - Course Outline Structure
  - UI
  - Summary
- Google Web Toolkit
- Architecture Diagram
- Hierarchical Course Outlines
Configuration in OSYL

• Syllabus Structure
  • Syllabus templates used at creation
  • File rules.xml define:
    • Content of Add menu (context-dependant)
    • Which rubrics are available for each context

• Syllabus vocabulary (including rubrics) are localized in properties file COMessages, and its French and Spanish versions
Configuration in OSYL: UI

• Layout and Presentation
  • CSS based
  • Cannot customize appearance in GWT code

• Messages relevant to UI are localized in properties file UIMessages.
Configuration: Summary

• Each Course Outline is associated to one config
• Each configuration contains:
  • Template (localized)
  • rules.xml
  • CSS and images
  • Messages files UIMessages and COMessages.
• A configuration is a folder under:
  webapps\osyl-editor-sakai-tool\osylcoconfigs
• Several configurations on a Sakai instance
OpenSyllabus Architecture

- Model-based application
- Configuration in OpenSyllabus
- Google Web Toolkit
- Architecture Diagram
- Hierarchical Course Outlines
OSYL architecture: Google Web Toolkit

- Open Source (Apache 2.0 License)
- Code in Java: compiler generates JavaScript
- Layouts and events similar to Swing
- You have to love and/or hate CSS!
- Easy AJAX (asynch. calls) through simple RPC and CallBack interface to OsylService (front to Sakai services)
- No more page concept
OpenSyllabus Architecture

• Model-based application
• Configuration in OpenSyllabus
• Google Web Toolkit
• Architecture Diagram
• Hierarchical Course Outlines
OpenSyllabus Architecture: Overview

OpenSyllabus GWT Client

- POJO
- M
- C
- V

Sakai Server

- Sakai services

OpenSyllabus Tool

- Services
- Servlet(s)

AJAX exchange of data model using GWT’s RPC implementation

Presentation Layer

Business Logic / Data Access

ModelToXML() -> XML

XMLToModel() -> POJO

July 2009 10th Sakai Conference - Boston, MA, U.S.A.
OpenSyllabus Architecture

- Model-based application
- Configuration in OpenSyllabus
- Google Web Toolkit
- Architecture Diagram
- Hierarchical Course Outlines
  - Example
  - Concepts
Hierarchical CO example

Economics 101 Generic course outline from Coordinator

- Course Introduction
- Contact Information
- Learning Material
- Assessments
- Lectures
  - Lecture 1
  - License 2
  - Lecture 12

Economics 101 Section A course outline from Section A’s teacher

- Course Introduction
- Contact Information
- Learning Material
- Assessments
- Lectures
  - Lecture 1
  - License 12

Economics 101 Section B course outline from Section B’s teacher

- Course Introduction
- Contact Information
- Learning Material
- Assessments
- Lectures
  - Lecture 1
  - License 11
Hierarchical Course Outline is possible because:

- Parent and child outline share the same semantic model
- OSYL know how to merge them
  - i.e.: put parent’s content then child content for each specific content unit
Draft vs Published Space

**Draft (editing) Space**

1: Creates and edits

Generic C.O.

Area of the system where Authors create and edit course outlines

5: Edits

Section C.O.

**Published Space**

2: Publishes

Generic (read-only)

Area of the system where Authors publish course outlines when ready for consumption by Students and/or Public

4: Selects as parent

Generic + Section (read-only)

6: Publishes
Presentation Plan

• What is OpenSyllabus?
• OpenSyllabus Architecture
• OpenSyllabus in Sakai
  • Integration with Sakai Tools: Resources, Citations and Assignment
  • Integration with Sakai’s Course Management and Academic System
• Process and tools used to build OpenSyllabus (if time permits)
OpenSyllabus in Sakai – Big Picture

Institution Academic System
- List of courses
- List of sections
- List of students
- Schedule
- Location
- ...

Sakai

Assignment

Resources

Course Management

More to come...

OpenSyllabus

Citation

OpenSyllabus in Sakai – Big Picture

July 2009 10th Sakai Conference - Boston, MA, U.S.A.
Sakai Tool Integration Factors

• Minimum Feature Set: as in ZoneCours
  • Documents ("Resources")
  • Bibliographic References ("Citations")
  • Assignment (part of Assessment)

• Goals of integration
  • Minimize costs and reduce cycle-time
  • Avoid ‘reinventing the wheel’
  • Participate in sharing
OpenSyllabus – The Tool Integrator

• So far:
  • We have integrated the Resources, Citations and assignment tools: acting as client using services of other tools
  • We have extended Citations, adding Z39.50 connector capability to connect to most of the libraries of the world.

• OSYL as server (prospective):
  • Could pass course outline info (assessment, lecture) to other tool (e.g.: agenda)
Tool Integration: Functional challenges

• What do our target users need?
  • Core functionalities
    • At least based on historical use of ZoneCours
  • Great user experience over feature set
    • UI uniformity with OpenSyllabus

Satisfy functional requirements and maintain or even enhance current user experience!
Tool Integration: Technical challenges

OpenSyllabus (User Interface)

Sakai Tool XYZ (Native User Interface)

Sakai Tool XYZ (Logic /Services)

Tool Communication at the Presentation Layer:
- Complex if possible
- UI change often
Tool Integration: Technical challenges

- OpenSyllabus (User Interface)
- Sakai Tool XYZ (Logic /Services)
- Simplified User Interface Parallel to the Native tool interface

Replicates partially the tool UI but allows more control over the UX
OpenSyllabus

Sakai Tool XYZ
Logic / Services

New Version

Tool Integration: Technical challenges

OpenSyllabus (User Interface)

Simplified User Interface
Native User Interface
Parallel to the native tool interface

No impact on interface
(if logic and services don’t change completely)
Tool Integration: Technical Challenges

• Possible interactions with a Sakai Tool
  • Front-end integration
    • Link to the tool with its complete native UI
    • OpenSyllabus provides some way to create an instance in the tool
  • Back-end integration
    • Develop new views wrapping the tool (access its services) and all its interfaces
• Hybrid integration
  • Link to the tool provided with a part of its native interface redesigned
Tool Integration: Data Synchronization

- Why?
- What?
- When?
Tool Integration: Resource Tool

- Navigate within sub-folders
- Upload from user’s file system
- Select documents (reuse)
- Organize documents by creating sub-folders
- Contextualize the use of selected document (Rubric, comment ...)

Selected File: H2009-1-177

- Show Document Details

Selected File:

- H2009-1-177-01.pdf
- H2009-1-177-1239.pdf
- H2009-1-177-1307.pdf
- H2009-1-177-1211.pdf
- H2009-1-177-01.pdf

Selected File: H2009-1-177

- Rubric
- Diffusion Level
- Options:
- Requirement Level

Rubric:

- Exercises

Diffusion Level:

- Public

Options:

- Hide
- Important

Requirement Level:


Moving to good business principles: analysis

Comment

Case written by our fellows of Boston College. They share their analysis with us to have our input on this important subject. It is not mandatory to consider this but it could be a plus to contribute to their blog.

Move to:
Tool Integration: Resource Tool

Same resource in two different contexts

**Exercises**

Moving to good business principles: analysis  (H2009-1-1771211.CaseFedex_en.pdf)

Case written by our fellows of Boston College. They share their analysis with us to have our input on this important subject. It is not mandatory to consider this but it could be a plus to contribute to their blog.

Diffusion Level: Public | Hidden: No | Important: Yes

---

**Context 1: in Lecture 1**

**Miscellaneous Resources**

The Fedex Case: Moving to good business principles  (H2009-1-1771211.CaseFedex_en.pdf)

This case will be presented during the first lecture. Please read it carefully before attending.

Diffusion Level: Public | Hidden: No | Important: Yes

---

**Context 2: in Pedagogical Material**
Tool Integration: Assignment Tool

• Assignment Tool for Electronic Submission

Conceptual view:

Current Integration:

- Assessment
- Assignment

Course Outline

Assessment

Assignment
Tools Integration: Citation Helper

- Basic use for bibliographic references
  - Add, edit and use normalized and structured references from scratch
- A little more sophisticated use:
  - Link a bibliographic reference to the institution’s library and databases
    - provides validation
  - Adding or importing a new reference by searching in Google scholar, RIS
Tools Integration: Citation Helper

- **Navigate within sub-folders**
- **Create a new citation**
- **Select citations (reuse)**
- **Contextualize the use of selected citation (Rubric, comment ...)**
- **Organize citations by creating sub-folders**
# Tools Integration: present & future

<table>
<thead>
<tr>
<th>Tool</th>
<th>Selected implementation</th>
<th>Data synchronization</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSIGNMENT</td>
<td>• A way to instantiate the Tool</td>
<td>• One Way partial data synchronization</td>
</tr>
<tr>
<td></td>
<td>• Use of the tool’s native UI</td>
<td>• Clickable text in OSYL synchronized live with Assignment title</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other strategies of data synchronization will be addressed later</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>• Access via sData</td>
<td>• Live one-way data synchronization</td>
</tr>
<tr>
<td></td>
<td>• Direct access from OpenSyllabus to the Resources</td>
<td>• Need for a two-way synchronization</td>
</tr>
<tr>
<td>CITATIONS</td>
<td>• A way to create a citation list</td>
<td>• Live one-way data synchronization</td>
</tr>
<tr>
<td></td>
<td>• Direct access to Library through Z39.50</td>
<td>• Need for a two-way synchronization</td>
</tr>
<tr>
<td></td>
<td>• Very similar to Resource integration</td>
<td></td>
</tr>
</tbody>
</table>

Current implementation

*Future implementation*
Presentation Plan

• What is OpenSyllabus?
• OpenSyllabus Architecture
• OpenSyllabus in Sakai
  • Integration with Sakai Tools: Resources, Citations and Assignment
  • Integration with Sakai’s Course Management and Academic System
• Process and tools used to build OpenSyllabus
OpenSyllabus in Sakai – Big Picture

**Institution Academic System**
- List of courses
- List of sections
- List of students
- Schedule
- Location
- ...

**OpenSyllabus**
- Assignment
- Resources
- Course Management
- Citations
- More to come...

Sakai

July 2009 10th Sakai Conference - Boston, MA, U.S.A.
Questions we had to answer:

- Hierarchical course outlines:
  - How different levels of course outlines map to Sakai sites?
  - How do we share resources and access to Sakai tools?

- Edit vs Published Space:
  - How to manage draft vs published resources?
  - Student shall only access published content.
• The institution’s Academic system feeds Sakai’s Course Management
• Challenges and open questions:
  • How to map hierarchical course outline to Sakai’s Course Management?
  • OpenSyllabus should integrate to any(most) Course Management implementation?
In edit space, each C.O. has its site with its resources.
Participants are added to site directly.
Author sees published parent documents and resources in read-only mode.

When published, all related COs are merged. All resources are copied to target site.
Only COs associated with a CourseOffering have a site.
Participants to site is provided by Enrollment Sets associated to CourseOffering.
Presentation Plan

• What is OpenSyllabus?
• OpenSyllabus Architecture
• OpenSyllabus in Sakai
  • Integration with Sakai Tools: Resources, Citations and Assignment
  • Integration with Sakai’s Course Management and Academic System
• Process and tools used to build OpenSyllabus (if time permits)
Process and tools

• Scrum methodology
• Feature and Use Case driven
  • Features for planning
  • Use Cases for development and testing
    • Level of details depends on complexity of feature
• User Testing / Focus Groups
• Jira / Confluence / SVN / Hudson / Selenium / XMLSpy
What’s next?

• Pilot at HEC Montréal in January 2010
• Migration from ZoneCours and user training: summer 2010
• Production in September 2010
To Learn More...

• 2 Presentations this afternoon (same room: Haym Saolman)
  • 3:15 Demonstration
  • 4:00 Hands-on
• See us tonight at the technical demonstrations
• Try OpenSyllabus at http://osyltest.hec.ca
• Confluence: http://tinyurl.com/opensyllabus
• Model: http://tinyurl.com/osyl-model
• Questions?