Sakaibrary: Bridging Course Management and Digital Libraries

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Outline

- Course Management Systems
- Motivations for integration
- The Sakai project
- Sakaibrary
  - Project overview
  - Technical implementation
- Conclusion and questions
Course Management Systems (CMS)

- Also known as Virtual Learning Environments (VLE) or Learning Management Systems (LMS)
- Becoming principal place for faculty-student interactions outside of the classroom
- Used for both traditional and online courses
- Examples: Blackboard, WebCT, Angel, Moodle, Sakai
Typical Functions of a CMS

- Course calendar
- Discussion forum
- Chat
- Online tests and quizzes
- Homework turn-in
- Grade entry/dissemination
- Content management
- ...
Motivations for CMS-Library Integration

- Library content and services important for teaching and learning
- Represents an evolution of library’s instructional support services (e.g. reserves) into the current environment
- Students often unfamiliar with library sources
- Needed for libraries to remain relevant to today’s students and teachers
What is Sakai?

- A software framework and set of tools and services for implementing “collaboration and learning” systems (including CMS)
- An organization: the Sakai Foundation
- A community: Sakai Partners

- “Community source” model
  - Both institutional and individual contributors
What is Sakai?

“Iron Chef”
Hiroyuki Sakai
Sakai: Origins

- Begun in 2003 by:
  - University of Michigan
  - Indiana University
  - Massachusetts Institute of Technology (MIT)
  - Stanford University
- Grant funding from Mellon and Hewlett Foundations
- Motivations
  - More control over institutional CMS destiny
  - Gain more value working as a group than by going alone
Sakai: Today

- 105 paying partners: universities, colleges, non-profit organizations, companies
- In production at 8 institutions in early 2006
- 11 more scheduled to go online Fall 2006
- Mainly US/UK (but not exclusively)
- Twice-annual conference
  - Last had over 550 attendees
Sakai Technologies

Java 1.4/1.5

Sakai 2.x

JavaServer Faces

Velocity

Spring

Hibernate

Tomcat 5.5

Oracle 9i/10g

MySQL 4.1

HSQL (demo)

Apache

SSL

mod_jk

WEBISO

Virtual hosting
Sakaibrary Project Overview

- Partnership of Indiana University (IU) and University of Michigan (UM) Libraries
- Supported by Andrew W. Mellon Foundation and IU/UM
- January 1, 2006 - June 30, 2008
- 2.5-3 FTE per institution
- Co-Project Directors:
  - Jon Dunn, Indiana University
  - Susan Hollar, University of Michigan
Additional Sakaibrary Project Partners

- Libraries at:
  - Johns Hopkins University
  - Northwestern University
  - Stanford University
  - Yale University
  - University of California Berkeley
Sakaibrary Project Goals

- Build tools to provide seamless integration of content from licensed library databases within Sakai for instructors
- Leverage existing library technology infrastructure
- Prototype functionality for librarians to present content in Sakai and students to discover licensed content within Sakai.
- Engage librarians, students, and faculty in the design and testing
Sakaibrary Project Process

- Develop requirements and designs with feedback from partner institutions
- Develop tools in two phases
- Conduct evaluation at IU and UM
- Release tools as open source
Tasks: Instructor

- Search for articles
- Import references from RefWorks, EndNote, etc.
- Create persistent links to articles for student access
- Create customized search box or “canned searches” for students
  - Constrained to search specific databases or include specific keywords
- Obtain assistance from librarian
Tasks: Student

- Access articles found by instructor
- Search for articles
  - Possibly constrained by course subject
- Export references to bibliographic management tools such as RefWorks
- Reference articles from assignments, papers
- Obtain assistance from librarian
Tasks: Librarian

- Create links to appropriate databases
- Create customized search boxes
- Create help guides and suggestions for use of library resources
- Provide assistance to instructor and student
Where does the library fit in Sakai?

- Library databases are just one source of course content
  - Web content
  - Personal documents
  - Digital repositories
  - Electronic reserves
- Need to be able to work with all types of content in the same way
Sakai Tools and Services

- Tool
  - User interface
- Service
  - Backend functionality
  - Can be used by many tools
Standard Sakai Tools

- Announcements
- Assignments
- Chat Room
- Drop Box
- Email Archive
- Gradebook
- Help
- Message Of The Day
- News/RSS
- Preferences

- Presentation
- Profile/Roster
- Resources
- Schedule
- Section Mgmt
- Syllabus
- Threaded Discussion
- Web Content
- Worksite Setup
- WebDAV
Sakaibrary Project Deliverables

- Phase 1:
  - Library search tool*
  - Citation management tool*

- Phase 2:
  - Subject research guide tool*

*And associated services
Library Search Tool

- Based on existing work
  - *Twin Peaks Navigator*
  - OKI: Open Knowledge Initiative
- Leverage existing Metasearch technology to connect to various search sources
Citation Management Tool

- New capability in Sakai
- Create references from library search, import, or direct entry
- Generate persistent links using OpenURL
- Support export of citations to RIS and other relevant formats
- Use RDF triplestore for persistence
UI Prototype

Here is a list of readings I’d like you all to peruse before we go to lunch today:

Add New Citation | Search for Citations

Update | Cancel
Step 1: Search Library Resources

Enter one or more keywords below and click "Search."

Keywords: food

Search  Cancel
Search for Citations

**Step 2: Select Search Results**

Select one or more results to add to the citation list and Click "Continue".


Back | Continue | Cancel
Search for Citations

**Step 3: Edit Citation Properties**

For each citation, select an appropriate copyright status. Then click "Finish".

- **Copyright status unknown**: [Roquefort vs Big Mac: Globalization and Its Others](http://example.com), Bodnár, Judit. European Journal of Sociology (2003), 44: 133-144.

- **Copyright status unknown**: [Supermarket shopping adoption and the modernization of food retailing : theory, method and application](http://example.com), Goldman, Arieh; Ramaswami, Seshan; Krider, Robert E. Marketing Working Paper Series; MKTG 99.134.

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Before Lunch

Citation List

Here is a list of readings I'd like you all to peruse before we go to lunch today.

Viewing 1 - 3 of 3 items

Citations


Subject Research Guides

- Support faculty and librarian creation of:
  - Constrained searches
  - Canned searches
  - Help guides
  - Links to contact librarians: chat, e-mail, course discussion forum
Technical Implementation
Technologies in Use

Indiana:
- Sirsi Unicorn
- Sirsi SingleSearch (MuseGlobal)
- ExLibris SFX

Michigan:
- Ex Libris Aleph
- Ex Libris MetaLib
- Ex Libris SFX

- Need to abstract across technologies from different vendors
How to abstract?

- **Goal:** Single UI, multiple backends
- **Solution:** OKI Repository OSID
  - **OKI:** Open Knowledge Initiative
  - **OSID:** Open Service Interface Definition (essentially an API spec)
  - Developed by MIT with Mellon support
  - Provides standard interface to repository query and delivery functions
  - Already in use in Sakai
MetaLib Integration

- Work being carried out by UM
- Creating an OKI Repository OSID implementation for MetaLib
- Using X-server for access to MetaLib functions
- Using CQL as internal query representation
- Working in tandem with developer at IU implementing Sirsi SingleSearch OKI OSID
<table>
<thead>
<tr>
<th><strong>Sakalibrary: (w/MetaLib)</strong></th>
<th><strong>Sakai Client</strong></th>
<th><strong>Sakalibrary Metasearch Service Implementation</strong></th>
<th><strong>MetaLib X-Services</strong></th>
<th><strong>Repository Components Encapsulating Metasearch Output Data</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abstract: Client</strong></td>
<td><strong>Metasearch Service Interface</strong></td>
<td><strong>Metasearch Tool</strong></td>
<td><strong>Metasearch Output Data</strong></td>
<td><strong>Sakai Metasearch Repository Components</strong></td>
</tr>
<tr>
<td><strong>Setup My Metasearch Service</strong></td>
<td><strong>initilize</strong></td>
<td><strong>login</strong> - establishes a connection with the K-Server. AuthW/Auth2 is done and a session_id is returned.</td>
<td><strong>getResources</strong></td>
<td><strong>ResourceSet</strong></td>
</tr>
<tr>
<td><strong>locate/choose the Resources I want to search</strong></td>
<td><strong>getResources</strong></td>
<td><strong>retrieve_quick_sets</strong> - retrieves a list of QuickSets per user profile. QuickSet set_sequence keys are returned.</td>
<td><strong>getRepositorySet</strong></td>
<td><strong>Asset</strong></td>
</tr>
<tr>
<td><strong>executeQuery</strong></td>
<td><strong>find</strong> - searches, using a find, request command (WIS, WIS-authors, etc.) in one or more specified sources. A results group_number is returned (this service can be asynchronous).</td>
<td><strong>mergeResults</strong></td>
<td><strong>merge_sort</strong> - merges and sorts result sets from different sources within one group_number. Returns a new set_number for the merged set.</td>
<td><strong>Query</strong></td>
</tr>
<tr>
<td><strong>View the Citations returned</strong></td>
<td><strong>getResults</strong></td>
<td><strong>search_quick_sets</strong> - searches, using a find, request, command within a specified QuickSet. A results group_number is returned (this service can be asynchronous).</td>
<td><strong>present</strong> - retrieves records from result sets. Either a set_number from find or search_quick_sets can be used or a new set_number from merge_sort.</td>
<td><strong>CitationList</strong></td>
</tr>
</tbody>
</table>
MetaLib X-Server Benefits

- Allows us to develop our own userinterface on MetaLib engine
- Relatively simple to use
- Documentation for the X-Server API exists and is easy to access
MetaLib X-Server
Limitations

- API documentation could be more robust: more detailed examples; edge cases
- Some X-Server XML encoding issues cause parsers/validators to fail:
  - Invalid XML character data
  - Repeated xmlns references for each record returned
  - Records do not contain proper MARCXML.
- Merge command does not have an appending merge option
  - Difficult to continuously page through records retrieved asynchronously from the X-Server
SFX

- Generating OpenURLs from citation data
- Used to link to full text content
Sakaibrary Schedule

- Fall 2006
  - Search and citation management
  - Internal testing at IU/UM
- Spring 2007
  - Subject research guide tool
  - Testing at partners (and beyond?)
- Summer/Fall 2007
  - Open source release
- After that
  - ???

Sakaibrary - IGeLU 2006
Questions As Yet Unanswered

- Who will use search within the CMS?
- Will metasearching ever be good enough?
- Will OpenURL link resolution work consistently enough for full text access?
- How will the Sakai development model work in libraries?
  - Will other institutions step up to tackle other library integration issues?
Thank You

- Sakaibrary project team
- Andrew W. Mellon Foundation
- Sakai Foundation board
- IGeLU organizers
More Information

- Sakai: [www.sakaiproject.org](http://www.sakaiproject.org)
- Sakaibrary: [www.dlib.indiana.edu/projects/sakai/](http://www.dlib.indiana.edu/projects/sakai/)
- OKI: [www.okiproject.org](http://www.okiproject.org)
- Sakai Library Discussion Group: [collab.sakaiproject.org](http://collab.sakaiproject.org)
- Contact: [jwd@indiana.edu](mailto:jwd@indiana.edu)