Integrating Digital Libraries and Traditional Libraries: Collaborating for Sustainability

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NSDL 2004 Chicago
iLumina is a digital library of sharable undergraduate teaching materials for chemistry, biology, physics, mathematics, and computer science. It is designed to quickly and accurately connect users with the educational resources they need. These resources range in type from highly granular objects such as individual images and video clips to entire courses. Resources in iLumina are cataloged in the MARC and NSDL metadata formats, which capture both technical and education-specific information about each resource. iLumina contains thousands of educational resources and several virtual collections. Please feel free to contribute your own resources to iLumina by following the contribute link in the header.
iLumina Digital Library

• One of 356 collections of the National Science Digital Library (NSDL)

• Features 1600 digital learning objects for undergraduate education in science and mathematics

• Funded by the National Science Foundation Digital Library Initiative Phase II (NSF DLI-II)

• Created by scientists using IMS-compliant metadata in XML format
iLumina History

• Original iLumina project (2000-2003) funded to develop database & interfaces for searching and contributing learning object resources

• With NSF funding ending, the key issue became sustainability of the collections

• The original team of scientists turned to librarians for collaboration
Sustainability Issues

• 80-88% of NSDL projects are university-based

• Libraries’ traditional roles are adaptable to the digital environment:
  – Innovative use of technology
  – Standards of bibliographic description
  – Philosophy of open access
Integration Issues

• What is gained by integrating iLumina into a traditional library catalog?
  – Wider dissemination
  – Stable environment

• What may be lost?
  – Contribution form for new submissions not integrated into catalog
  – Robust search form with multiple pull-down menus
iLumina Goals

• Current iLumina project (2003-2005) funded with scientist-librarian team in place

• Goal 1: Create a widely applicable model for sustaining NSDL collections beyond the period of their grand funding

• Goal 2: Develop a method for enhancing access to the digital resources contained in the collections
Librarians’ Roles

• Cataloging, Systems, Technical Services, & Public Services librarians involved as a team
• Provide expertise in bibliographic standards
• Analyze and study iLumina record fields
• Create metadata crosswalks
• Harvest the digital library’s metadata
• Convert metadata to MARC format
• Add records to local library catalog and WorldCat
Cataloging Challenges

- iLumina record fields vs. MARC fields
  - Fields not in local system load table
  - Fields not indexed in local library system
  - Lack of label for 5xx fields in MARC
- Limiting searches to iLumina
  - Location scoping
  - Advanced keyword search
- Determining publisher, distributor
Metadata Scheme Crosswalks

• Two tracks for iLumina data:
  – Ending at NSDL
  – Going into local library and ending at WorldCat

• Three initial crosswalks considered before availability of Innovative XML Harvester

• Two final crosswalks created and used after understanding functionality of XML Harvester
Crosswalks Continued

• Experimental crosswalks:
  IMS-DC-MARC
  IMS-MARC-DC
  IMS-MARC

• Final crosswalks:
  IMS-NSDL_DC (Qualified DC)
  IMS-MARC XML
Innovative XML Harvester

• Converts XML data to MARC and provides mechanism for loading records
  – DC (Unqualified) to MARC
  – MARC XML to MARC
  – Other XML schemes to MARC

• Processes XML data through OAI provider
Metadata Harvesting

IMS dB (original)

Metadata Converter.
Writes record in three formats.

NSDL_DC
Qual DC

MARC XML
MARC21_Slim

OAI_DC
Unqual DC

Not implemented

OAI Provider

Innovative XML Harvester:
MARC XML to MARC records

CatME
Library software to edit and send records to OCLC

NSDL

Harvest 1

Harvest 2

Harvest 3

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# Metadata: IMS to MARC

<table>
<thead>
<tr>
<th>Author</th>
<th>Christian, Wolfgang</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Hydrogen, v4.0 package [electronic resource]</td>
</tr>
<tr>
<td>Publisher</td>
<td>[Wilmington, N.C.]: Lumina, 2002</td>
</tr>
</tbody>
</table>

## Click on the following:

- View for online learning resource
- View additional information

### Note
Type of file: Java Applet, class (application/java-class), html/text/html
Learning resource: example, tutorial
Interactivity: low
Difficulty: easy
Structure: individual learning resource
Cost: no

Copyright: Physlets, that is, the applets themselves, may be used to author new problems and those problems may be distributed along with the Physlets files for non-profit, educational purposes without requesting permission under certain conditions. Please contact the author for these conditions.

Submission date: 5/23/2002

### Summary
This section contains three Physlets that plot the radial wavefunction, angular wavefunction, and the probability density in the z-plane. Principal quantum numbers from n = 1 to n = 50 are supported.

### Note
End-user license

### Subject
- Physics - Computer-assisted instruction
- Internet in education
- Wave functions
- Quantum theory
- Field theory (Quantum)

### Author
Bellino, Marco
Lumina
Harvesting to Library

- Customize local library system load table
  - 270 field

- Review local library index table
  - 024 indexed in ISN (I)
  - 516 indexed in Keyword notes (w)
Clean up and Enhancement

• Catalog librarians enhance harvested iLumina records in local library database
• Authority work
  – LC Subject Headings
  – Name authority
• Bibliographic quality control
  – Punctuation & capitalization
  – Abbreviations
  – Fixed fields
Sending Records to WorldCat

• Import enhanced iLumina records from local library system into CatME

• Batch upload iLumina records file to OCLC WorldCat
iLumina’s Future

• Integration of submission, review, & cataloging processes within library

• Determination of usage trends by monitoring library holdings added to iLumina records in WorldCat

• Implementation of plans to increase size of the collection

• Creation of model for sustainability through documentation of the integration process
Collaboration & Teamwork

• Benefits for scientists and librarians

• Scientists learn about record structure and bibliographic standards and conventions

• Librarians learn about NSF environment, grant writing, new resources for science instruction, and new XML/OAI applications

• Both groups explore ambiguity of terminology: “library,” “cataloging,” “metadata”
Implications

• Sustainability is an important challenge for digital collections

• Integrating digital collections into an established university library catalog is a feasible model

• Non-librarians will be increasingly involved in creating digital collections

• Librarians can collaborate to provide expertise in library systems and bibliographic standards and conventions
Additional Web Resources

• NSDL
  http://www.nsdl.org/

• IMS
  http://www.imsglobal.org
  http://www.imsproject.org/metadata/imsmdv1p2/imsmd_infov1p2.html

• OAI
  http://dl.uncw.edu:8080/oai/index.jsp
  http://www.openarchives.org

• Dublin Core
  http://dublincore.org/documents/dces/
The iLumina Team

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