Help, I’m Lost! Developing a Library Mapping System without Breaking the Bank

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Help, I’m Lost!

Developing a Library Mapping System without Breaking the Bank

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Introduction

• Development of a library mapping system for WSULS

• Ability to show locations of information for all physical resources

• Low cost development
  – Started as “impossible” graduate project
Paul Gallagher

- Developer Librarian for Wayne State University Library System
- Ten years of I.T. experience including application development, technology instruction, and system administration
- 2009 Graduate of WSU’s School of Library and Information Science, as part of the “Recruiting and Educating the 21st Century Fine and Performing Arts Librarian” IMLS grant
Problem

• Wayne State Library System (WSULS) has:
  – Three main facilities
  – Two special libraries (law and medical)
  – An extension center library
  – Approx 3.6 million items
  – 362 material locations as defined in the catalog
  – Undergoing collection maintenance in various areas
Problem

- 36,525 Directional Reference Questions in 2010
  - 48.54% of total reference questions

- Lots of small special use collections
  - Elephant Bibliography
  - Sci and Engg Library Advanced Computing Facility
  - Sci and Engg Library Searching Room
  - Purdy-Kresge Library Vault
MapIt!@WSULS

• Project began in August 2009, completed February 2010
• Displays shelved materials, as well as information for all location codes specified in the WSULS Millennium ILS
• Easily updatable by Access staff to support shifting collections
Topics

• Methods & Examples
  – Notably the “Hybrid Approach”
• Accessing the system
  – Catalogs
  – Reference Form
• Location Codes (and why do I care?)
• Updating the system
• Demonstration
• Results and Lessons Learned
Methods & Examples

- General design patterns for library mapping*
  - The “simple solution”
  - Pure vector based mapping
  - SVG hybrid
  - GPS (Google API)
  - Simple vector hybrid

*Not all inclusive
Methods & Examples
Simple Solution

• Create a map for each call number range
• Load maps onto web server / catalog
• Design method to have catalog show the correct map for each range
Methods & Examples

Simple Solution

etc....
Methods & Examples
Simple Solution

• Pros
  – Easy to develop, create maps in illustration software and place on web server/OPAC
  – Little programming required
  – Can use interactive maps

• Cons
  – Difficult to update with shifting collections
    • Must update potentially hundreds of maps!
Methods & Examples
Simple Solution

• Not suitable for WSULS
  – Number of call number ranges would be difficult to update
  – Would not be easily updatable by staff (without illustration software, training, etc...)

[Wayne State University Library System logo]
Methods & Examples
Pure Vector / MapServer / GIS Approach

• Uses X,Y coordinates to create a map for a specific call number range
• Use programming to convert the coordinates to a web graphic
• Approach typically used in Global Information Systems (GIS) software
Methods & Examples
Pure Vector / MapServer / GIS Approach
Methods & Examples
Pure Vector / MapServer / GIS Approach

• Pros
  – Interactive interface (Layers, zooming, etc...)
  – Could be leveraged with usage data to produce choropleths (heat maps) to show most used areas

• Cons
  – Lots of technology to implement
    • MapServer, GIS software, etc
  – Difficult to update, designed to work with generally static data
    (*Millipedes don’t shift much*)
Methods & Examples
Google API / GPS

• Use Google Maps or similar API to overlay library maps
• Relates library map to actual physical location using Latitude and Longitude or GPS
• Possibility of working with mobile “location awareness” and have a mobile device “point” to the location of a book
Methods & Examples

Google API / GPS

• Pros
  – Google styled interface

• Cons
  – Provides some usage data to Google
  – Difficult to create maps (tiling...)
  – Difficult to update
  – GPS generally* won’t work in libraries
  – Difficult to program
    • At least in August 2009 it was!
Methods & Examples
Hybrid Approach

• Uses combination of static files to define the library space, and vector coordinates to highlight specific areas
• Allows easy updating of call ranges by updating vector data
• Allows easy updating of stack placement by updating template images
Methods & Examples
Hybrid Approach

• Allows for easy updates with a “draw a box” mechanism
• Keeps number of static (template) maps to a minimum
• Easy to develop using PHP
Methods & Examples
Hybrid Approach

• WSULS only requires 11 template maps
• But currently requires over 70 maps for mapped call number ranges.
  – Plus call number ranges can be updated without having to use any illustration software.
Methods & Examples
Architecture of WSULS system

• LAMP application (Linux, Apache, MySql, PHP)
• Only external dependency is GD to combine the images
• Patron display areas (catalog and reference form), and staff update area
Accessing the System

• Two methods of access
  1. From the two WSULS catalogs
  2. From a form designed for use at reference
Accessing the System Catalog

- Catalog Method
  - Uses Millennium WebBridge to only show mapping link when appropriate
    - Won’t show for checked out items, etc...
  - Prompts if more than one item is available
  - Shows information about any of the WSULS location codes
Accessing the System Catalog

• Provides information on more than just shelved materials
  – All collection codes, including:
    • Storage
    • Closed Collections
    • Extension Centers
LOCATE MATERIALS IN THE LIBRARY

Select which item to map

☐ Catch-22: antiheroic antinovel
  Location: Purdy-Kresge Library, Call Number: PS 3558 .E476 C3385 1989

☐ Catch-22: antiheroic antinovel
  Location: Purdy-Kresge Library, Call Number: PS 3558 .E476 C3385 1989 v.2 c.3

Submit

Questions? Problems? Let us know!
LOCATE MATERIALS IN THE LIBRARY

Purdy Library - 2nd Floor

Library: Purdy, Floor 2
Call Number: PS 3558 .E476 C3385 1989
(American Literature)
Shelf Number Range: 129-162

The red area is the approximate location of the item.
Questions? Problems? Let us know!
Accessing the System
Catalog – Accessing Data

• Uses III Millennium WebBridge product to add link to catalog
• Utilizes Millennium XML server as well as:
  “a custom developed data ingest method built on best practices of innovative new methods to harvest bibliographic data...”
Accessing the System Catalog – Accessing Data

User Initiated
Click on Catalog Link

XML server request, returns III record number

Item detail screen scrape page from staging server

URL:
http://www.lib.wayne.edu/forms/maps/index.php?&oclc=32552169&title=Radio&type=1

URL:
http://elibrary.wayne.edu/xmlopac/o32552169/1/1/1/10?link=i12&nodtd=y&noexclude=WXROOT.Heading.Title.IIIRECORD

Accepts: OCLC Number
Returns: III Record Number

URL:
http://elibrary.wayne.edu:2082/record=b31310502&nodtd=y&noexclude=WXROOT.Heading.Title.IIIRECORD

Accepts: OCLC Number
<table>
<thead>
<tr>
<th>Location</th>
<th>Call No.</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate Library</td>
<td>PS 3553 .E476 C3 1996</td>
<td>DUE 10-01-08 BILLED +1 HOLD</td>
<td></td>
</tr>
</tbody>
</table>

**Author**: Heller, Joseph.

**Title**: Catch-22 / Joseph Heller.


**Description**: 463 p. ; 21 cm.

**Note**: "With a new preface by the author"--Cover.

**Subject**: World War, 1939-1945 -- Fiction.

**Genre**: War stories.

**ISBN**: 0684833395 (pbk.) : $10.00

Permanent url for this catalog record: http://elibrary.wayne.edu/record=b1437455-547
Accessing the System Catalog – Location Codes

• Each location can:
  – Display static HTML content
  – Display a call number range map
  – Be mapped to another code
    • “Oops” cases
    • i.e. - Map weird codes to reference
Accessing the System
Catalog – Location Codes

• Two “levels” of information based on location codes
  – **pbstk** = Purdy-Kresge Library shelved books
    • Displays stack map of call number range
  – **pdfdn** = Purdy-Kresge Library Foundation Collection
    • Maps to static content
    • Needs to show user where to location this collection, not necessarily show shelf location
      – Uses static HTML for output
Accessing the System Catalog – Location Codes

**Location Table**
- LocationCode
- DoCallNumberLookup
- MapToAnotherCode
- Content

If DoCallNumberLookup = true

**Overlay Table**
- LocationCode
- XCoordinate
- YCoordinate
- Width
- Height

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Wayne State University

Locate Materials in the Library

Purdy-Kresge Library Foundation Collection

The Purdy-Kresge Foundation Collection is located on the first floor, right of the computer area and left of the offices for content delivery.

Questions? Problems? Let us know!
LOCATE MATERIALS IN THE LIBRARY

PURDY-KRESGE LIBRARY FOUNDATION COLLECTION

The Purdy-Kresge Foundation Collection is located on the first floor, right of the computer area and left of the offices for content delivery.
LOCATE MATERIALS IN THE LIBRARY

OAKLAND CENTER LIBRARY SERVICES CENTER

The Oakland Library Services Center maintains a collection of key Reference and Reserves materials that are available for use in the building. Computers in the Library Services Center provide online access to a number of valuable information resources including the holdings of the Detroit Area Library Network (DALNET), full text periodicals databases, and the Internet.

For more information, please visit their website

Wayne State University-Oakland Center

33737 W 12 Mile Rd
Farmington Hills, MI 48334-3359
(248) 553-3545
wayne.edu

Directions Search nearby more ▼

View Larger Map
LOCATE MATERIALS IN THE LIBRARY

PURDY-KRESGE LIBRARY JUVENILE

The Juvenile Collection is one of the largest collections of this kind in a university library. It contains over 60,000 items. The collection covers age groups from preschool to some lower level college. It includes all subject areas and has special subsections for fiction, biography, and picture easy books. This collection was started by the College of Education in the early 1940s as a resource for training teachers. It is currently located on the fourth floor of the Purdy Library.

Additional information about this area can be found at the PK reference desk, found on the first floor.

Purdy Library - 4th Floor
Catalog

User Input

Catalog Link (Tier 1)

Processing / Pages

index.php
mapping start page

Number of Copies?

= 1

map_selector.php
user selects which item to map

> 1

map_display.php

Data Sources

XML server

Screen scrape

Updates

Updates

Reference Form (Tier 2)

MySQL Location table

MySQL Overlay table

pbstk
QP 408 .W64 2007

Reference Form / Display

If FALSE

Output static html content

If TRUE

Get call number template and X, Y coordinates

Output dynamic map
FIND AN ITEM IN THE LIBRARY

Here you can map call numbers to locations in the library system. Simply select a library, enter a call number or subject, and the system will show the approximate location of that item on the shelves. For more information, please watch our video about the mapping system.

NOTE: This area is currently undergoing maintenance by library staff. Items may differ from the map, and signage may be incorrect. For assistance finding an item, please visit the reference desk.
FIND AN ITEM IN THE LIBRARY

Here you can map call numbers to locations in the library system. Simply select a library, enter a call number or subject, and the system will show the approximate location of that item on the shelves. For more information, please watch our video about the mapping system.

MAP BY CALL NUMBER  MAP BY SUBJECT

Select a library: Purdy/Kresge Library

Select a subject: His

Auxiliary Sciences of History
Buddhist History
Const. Hist. & Admin. U.S.
Const. Hist. & Admin. Asia, Africa
Const. Hist. & Admin. Canada, Latin America
Const. Hist. & Admin. Europe
Constitutional Hist. & Admin.
Economic History & Conditions
Hist. & Systems, Modern
Hist. of Civilization & Culture

Displaying 1-10 of 63 results

Questions? Problems? Let us know!
Updating the system

• Web based update system
• Two levels
  – Location Codes
  – Call number ranges
Updating the system

• Component of internal CMS’esque website update system
• Call number and collection updates handled by Library Access Department
  — Thanks Guys!
Updating the system

• Long term viability of system dependant on early buy-in from Access Services
• Updates *need* to be intuitive, fast, and efficient.
WSULS Stack Mapping Update Application

The WSULS Library Materials Mapping application is designed to allow staff and patrons find materials on the library shelves.

The system can be used in two ways, either via a link in the catalog, or with a form created for use at reference.

There are two 'levels' of maps that the system can return. The first type is static HTML content for any location code used in the millennium system. The second type is the actual callnumber map system used for certain location codes (ie. - pbert, the books in Purdy-Krames). Both levels of codes can be updated in this system.

Update Location Information

This will allow editing "flat" maps, or locations in the III system that are displayed without checking the item's call number. Examples include pbrf (Reference), and pbrf (PK Bindery Repairs). Location can have one of three outcomes:

- Mapped To: Map the field to another location. For examples, all items in closed collections can be mapped to reference.
- Content: Say something about that location, such as who to contact, or where it is located.
- Call Lookup: Lookup the call number in and display a map.

Update "Call" Number Maps

These are maps that will check the call number, and overlay a red area on a certain map area.

Upload Content Images

This will upload image files that can be used with the "static" mapping system. Examples include maps of reference and circulation desks, and pictures of collections. For more information, contact: Paul Gallagher Developer Librarian paul.gallagher@wayne.edu
<table>
<thead>
<tr>
<th>Add New</th>
<th>Location Name</th>
<th>ILC Code</th>
<th>Library</th>
<th>Floor</th>
<th>Mapped To</th>
<th>Content</th>
<th>Call Number Lookup</th>
<th>Undergoing Maintenance</th>
<th>Collection Overlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit</td>
<td>Electronic Reserves</td>
<td>esrv</td>
<td></td>
<td></td>
<td></td>
<td>This item is available via...</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Electronic Theses and Dissertations</td>
<td>elths</td>
<td></td>
<td></td>
<td></td>
<td>This is an electronic title...</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Elephant Bibliography</td>
<td>stbr1</td>
<td>Science and Engineering</td>
<td></td>
<td>srep</td>
<td></td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Internet Sites</td>
<td>eenet</td>
<td></td>
<td></td>
<td></td>
<td>This item is a website and...</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Karmanos Cancer Institute Simons Library</td>
<td>jbsim</td>
<td>Karmanos Cancer Institute</td>
<td></td>
<td></td>
<td>The Karmanos Cancer Institute Library</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Hearing Assist Device</td>
<td>tahad</td>
<td>Law</td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library</td>
<td>lbtk</td>
<td>Law</td>
<td>2</td>
<td></td>
<td>lkco</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Audiovisual</td>
<td>laavl</td>
<td>Law</td>
<td></td>
<td></td>
<td>lkco</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Casebooks</td>
<td>lbckb</td>
<td>Law</td>
<td></td>
<td></td>
<td>lkco</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Circulation Desk</td>
<td>lbcko</td>
<td>Law</td>
<td>1</td>
<td></td>
<td>lkco</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library CIS Microform Collection</td>
<td>lgdis</td>
<td>Law</td>
<td>1</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Computer Lab</td>
<td>lilab</td>
<td>Law</td>
<td>1</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Course Reserves</td>
<td>lcrsz</td>
<td>Law</td>
<td></td>
<td></td>
<td>lkco</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Documents</td>
<td>lgtoc</td>
<td>Law</td>
<td>B</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Documents (non-circulating)</td>
<td>lgndc</td>
<td>Law</td>
<td></td>
<td></td>
<td>lkco</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Edward M. Wise Collection</td>
<td>lremw</td>
<td>Law</td>
<td></td>
<td></td>
<td>In 2000 the law libr...</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Edit</td>
<td>Law Library Electronic Resources</td>
<td>leara</td>
<td>Law</td>
<td>1</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
**Library Location Code Editor**

* Items marked with an asterisk are required

<table>
<thead>
<tr>
<th>Field</th>
<th>Field Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Name *</td>
<td>Purdy-Kresge Library</td>
</tr>
<tr>
<td>Ill Code *</td>
<td>pbsk</td>
</tr>
<tr>
<td>Library</td>
<td>Purdy</td>
</tr>
<tr>
<td>Floor</td>
<td></td>
</tr>
<tr>
<td>Mapped To</td>
<td></td>
</tr>
<tr>
<td>Content</td>
<td></td>
</tr>
</tbody>
</table>

Call Number Lookup  
- No
- Yes

Undergoing Maintenance  
- No
- Yes

Collection Overlay  
- No
- Yes

0/106605
Select an area: Purdy Second Floor

Select a call number range to update: 93-94: PR3456M - PR4167P  OR  delete a range

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>Shelf</th>
<th>Undergoing Maintenance?</th>
<th>Y</th>
<th>X</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR3456M</td>
<td>PR4167P</td>
<td>93-94</td>
<td></td>
<td>84</td>
<td>361</td>
<td>338</td>
<td>263</td>
</tr>
</tbody>
</table>

Submit

NOTE: Call number ranges MUST NOT OVERLAP.

Purdy Library - 2nd Floor
Demonstration

- Millennium Classic Catalog Link
- Encore Link
- Reference Form
- Update/Administration Area
Results and Lessons Learned

• Patrons still can’t find the restrooms
  – Only part of a total solution to library path finding

• Call number ranges may be too large
  – Ongoing testing with mapping to shelf level
  – Shelf level mapping may work as a method to generate new shelf signage
Results and Lessons Learned
Usage Statistics (Oct 2010)

• Catalog Use
  – 617 visits
  – 19.9 visits per day

• Reference Form
  – 379 visits
  – 12.2 visits per day

• WSULS Website
  – 156,508 visits
  – 5,048 visits per day
Results and Lessons Learned
Usage Statistics

• Functionality lost in Encore
  – Better visibility in Millennium Classic
  – Which no one uses anymore...

• Planned integration with library mobile website (m.lib.wayne.edu)
  – May make more sense in a mobile context

• Value in creating printed maps at reference desk
Results and Lessons Learned

Open Source?

• We’re “evaluating all possibilities and awaiting response from other stakeholders for potential collaboration and buy-in...”
  – (Ok, it’s likely – looking at December 2010)

• Institutions would need to have their catalog provide location code and call number
  – Dewey not currently supported, but an easy and likely enhancement

• http://www.lib.wayne.edu/maps/updates/
Questions?

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