Dynamic Map Display in Web OPAC:

An Experiment at Wichita State University Libraries

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ABSTRACT: Adding more features to the web OPAC or making the Integrated Library Management Systems (ILMS) more compatible to external web services has been a tendency in recent years. Wichita State University (WSU) Libraries' Dynamic Map Project enriched the bibliographic information by displaying dynamic map(s) for each individual record in the web OPAC. Dynamic mapping provides a customized map display in an online public access catalog to give library patrons directional information to the shelved items. This article will discuss how the dynamic map project evolved and the pros and cons of using holdings records versus bibliographic records to generate the maps. It will describe the programming logic of the interactive direction maps to handle complex shelving situations. It will also address how to transfer data from the OPAC display to a processing program, and then combine this data with the data from linked tables in MS Access and an ILS database. User feedback and future possible enhancement of dynamic mapping in a library will also be discussed.

I. Introduction

Adding more features to the web OPAC or making the Integrated Library Management Systems (ILMS) more compatible to external web services has been a tendency in recent years. Specific applications are numerous. Syndetic Solutions offers enriched bibliographic content, including tables of contents, book reviews, summaries, book-cover images, first chapters, excerpts, and fiction and biography profiles, which may be used in the ILMS staff interface as well as in the OPAC display (Syndetic, 2007). Amazon.com also provides added-value features and

functionalities which can be linked to OPACs. SIRSI's iBistro e-library offers a link to Amazon.com from each full-record view screen, and provides information such as author biographies and table of contents (Sirsi). Open URL and link resolver enable normalization and enhancement of the metadata in the knowledge base through linking (Apps, 2005). Sirsi Resolver can link citations to relevant resources such as full-text articles across databases and vendors (Sirsi). AquaBrowser provides search, discover and refine functions, which show a relevance-ranked result list, display visualized word-cloud search suggestions, and enable the users to refine their search by zooming in specific areas in the search results (Kaizer & Hodge, 2005). The North Carolina State University Libraries incorporated Endeca's information access platform into its library catalog, and created its "next generation catalog? featuring searching and relevance ranking of results, browsing function, and improved subject access (Antelman et al, 2006). Sokvitne (2006) points out that the library and information services field "recognizes a new web environment (web 2.0) and the need to develop a new library environment (library 2.0)? and these include blogs, podcasts, gaming and tagging, etc. His paper describes the State Library of Tasmania's experience in developing a new OPAC by exporting bibliographic data to a software package outside of the ILMS (2006).

Wichita State University (WSU) Libraries have also experimented on how to enhance the ILMS with external web services. Its Dynamic Map Project enriched the bibliographic information by displaying dynamic maps for each individual record in the web OPAC. Dynamic mapping provides a customized map display in an online public access catalog for library patrons. After the patron has initiated a search and selected a particular book or other library resource, he or she is given an option to view a dynamic or interactive map for the chosen resource. The dynamic map will display to the patron directional information such as the specific library branch which holds the resource, the floor of the library where the resource will be found, the specific department location, the general location of the shelving range, and a moving image display, which shows the searcher which direction to turn as they exit the elevator. The dynamic map is also useful for printing and highlights important information such as the call number of the item and item description details.

This article will discuss how the dynamic map project at WSU Libraries evolved as well as the pros and cons of using holdings records versus bibliographic records to generate the maps. It will describe the programming logic of the interactive directional maps to handle complex shelving situations. It will also illustrate how to transfer data from the OPAC display to a processing program, and then combine this data with the data from linked tables in a database built with MS Access and an ILMS database. Future possible enhancement of dynamic mapping in a library will be discussed as well.

II. The Dynamic Map Project

How to facilitate patrons locating books or other materials in libraries has been a persistent challenge for librarians. Library materials are generally arranged by call numbers, which determine their shelving locations. The range of call numbers on each floor or aisle is often identified on the entrance of a floor or by an aisle marker. Many university libraries give map directions on their library websites, and some libraries link records in their OPACs to a floor plan map where the item is located. The Auburn University Library designed an image label in its OPAC view for the bibliographic record, and the label is linked to a floor plan in the PDF format. Worcester Polytechnic University Library Catalog provides a "location?label, linked to a webpage called "A-Z Listing of Locations Mentioned in the Library Catalog? and these locations are further linked to different floor plan webpages. Western Michigan University Library's Catalog attached a "location?label for each record, which is linked directly to a floor plan webpage. These services have improved retrieval and "visibility?of the library materials, as compared with traditional physical identification on different floors or beside the aisles. However, they have not provided a specific direction for each record in the OPAC.

Wichita State University Libraries have taken a step further by providing dynamic location maps in their OPAC as early as in the Fall of 2006. This new feature displays specific locations and shelf maps of the library stacks for individual books or other types of materials, including electronic resources.

1. Complex Shelving Situations at WSU Libraries

During the WSU Libraries OPAC redesign project in 2006, one committee member proposed to provide clearer and more specific online directions for the collections to alleviate the situation when students easily get lost among various libraries, different floors or collections. The Wichita State University Libraries consist of the Ablah Library, and Music Library and Chemistry Library branches. Ablah Library is the main library, and its collections are arranged on four floors. In Ablah Library, besides the main stacks, large specialized collections hold important research materials such as Government Documents and Special Collections. Other locations include Reserves, Reference Stacks, Reference Desk, Folios (Oversize), and New Book Room. For materials with multiple formats, DVDs, CDs or microforms are placed separately from the books. Materials in each location are arranged by call numbers. Within the main library, multiple classification schemes are in use, including LC, SUDOC, accession numbering, and other local schemes. Folio are placed on all three floors and arranged separately by call numbers.

As in other libraries, WSU Libraries provided building maps, floor guides and ample signage, but patron confusion still existed. The library tried to name locations carefully and to customize messages in its OPAC display screens, but there were system-imposed limits to the length of messages that could be displayed. WSU chose

to respond to these access limitations by first developing basic maps, and then by creating more robust dynamic maps.

2. Programming Logic of Interactive Directional Maps

In order to display a directional map according to the call numbers of searched records, selected fields such as call number, title, author, etc. must be transferred from an OPAC bibliographic record display to a processing routine. Following this step, the map can be displayed according to the class number. Currently, almost all major integrated library management systems provide a methodology in OPAC to transfer a URL string with ISBN to third-party vendors in order to bring back additional information, such as cover images, book reviews, and table of contents, to the OPAC display. This method can be used to transfer a URL string which contains other bibliographic fields as long as the syntax is correct.

First, we tried to transfer call numbers to a processing page. In a MARC record, call numbers may be found in the 050, 086, 090, 092 or 099 fields. In a large catalog, several call number fields may be utilized so it is hard to predict the location of the call number in the bibligraphic record. Thus, all data in each possible field has to be transferred. This makes scripting in the OPAC display configuration file very difficult. This combination of data is also not easy to handle in the processing program.

Call numbers are also stored in the holding field of the MARC records. In the WSU catalog, this information could be found in the 852. However, it was not possible to script a transferring string from a holding configuration file, as the transferring ISBN was only in a bibliographic configuration file.

WSU Libraries were faced with a challenge as how to obtain the call number, title, and author so that such information could be displayed in a directional map. Most ILMS store the bibliographical record and holding records in Oracle tables. So other than Web OPACs, or staff client modules, users could access the data in Oracle through a database layer, such as ODBC (Open DataBase Connectivity). Usually, this is a read-only interface, designed to allow library staff to get statistics. But ODBC can get almost everything from a database as long as a bibliographic record identifier can be decided. The Bib_ID (001) field in a MARC record can be the best option for a record identifier, and it is easy to transfer to a processing routine.

In the same manner as transferring the ISBN to the vendor, we transferred bibliographic ID field to a processing routine with a connection to ILMS tables through an ODBC layer on a Windows 2003 server. The routine will query the ILMS tables, and export the call number, title, author, etc., and display them in the dynamic map in webpages.

3. Data Processing

The data coming from the ILMS tables is processed and displayed by the processing routine. As mentioned earlier, WSU Libraries have a very complex shelving arrangement. Not all items are shelved by call numbers; the presence of call numbers largely depends on the format of holdings. One bibliographic record could have different formats of holdings attached. In order to display the map precisely, the map must be displayed at the holding level. The processing routine identifies the holding location first, and then displays the map accordingly. For example, locations such as Special Collections and Government Documents areas on the floor maps are too small to display the map according to the call numbers. Consequently, a location map will be displayed instead of a shelving position map. A shelving map will be displayed if a location in the library stack is shelved by LC class.

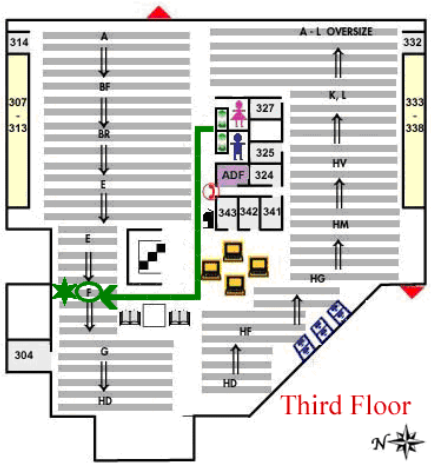
Other complex shelving situations tackled with in the processing routine are:

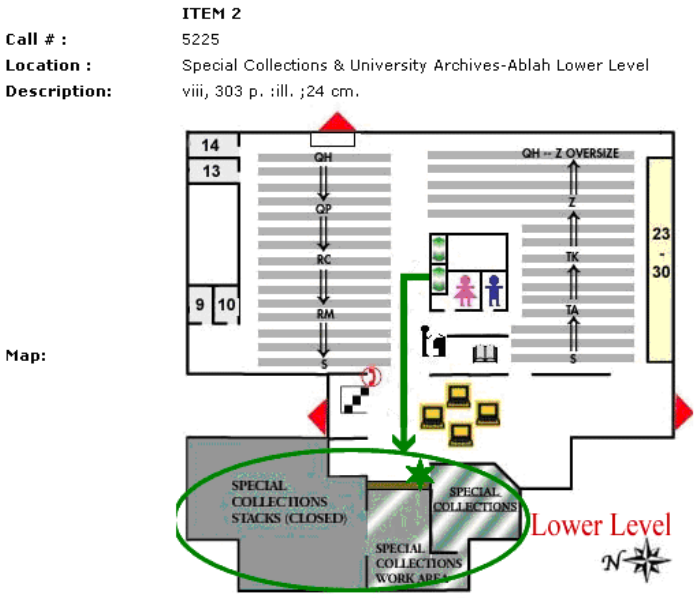
1. Multiple maps are displayed for holdings at different locations. For example, a book published long ago with more than one copy in the libraries could be available in multiple library locations: one copy may be in the library stacks and another could be in Special Collections. The routine will display both maps.

Title : West of Wichita : settling the high plains of Kansas, 1865-1890 /
Author :

ITEM 1
Call # : F686 .M56 1986
Location : Ablah(A-LC on Floor3)(LD-QE on Floor2)(QH-ZA on LowerLevel)
Description: viii, 303 p. :ill. ;24 cm.

Map:





2. Figure 1: Multiple Maps Displayed for Different Locations in OPAC
3. Multiple maps are displayed for holdings in different formats. Fox example, a book with both print and electronic formats will be displayed separately. A map is displayed for the print copy, and a link connecting to the online resource is displayed for the electronic copy.
4. Some special areas in the library stack, such as Folios (oversize books), include the entire range of LC classes and are shelved on multiple floors. The routine processes folio information separately from other books in the library stacks. The routine compares the call number with the range of LC classes, and then decides which floor map should be displayed for this holding record.
5. Many books come with accompanying DVDs, video cassettes, or audio recordings in the library. For security reasons, these audiovisual materials are separated from the books and shelved in the Reserve Area. The accompanying material data is in the 300 field in the MARC record. The routine puts the 300 field received from the OPAC record display page into a variable. If the variable contains DVD, video, or audio strings, the second map of the Reserve location will be displayed for these accompanying multimedia materials.
6. Music and Chemistry branch libraries in WSU do not have floor or shelf maps. When materials in these branch libraries are identified based on the holding location, a map showing the route from the main library to these branch libraries will be displayed.
7. Some materials in special formats, such as microfilm, used to be shelved in library stacks, but are now changed to the Microfilm Area. Although the holding location is still library stack, the processing routine checks the string in holding call number which starts with “Microfilm? and display the location map based on that string instead of the LC class.

The following diagram shows the data processing flow:

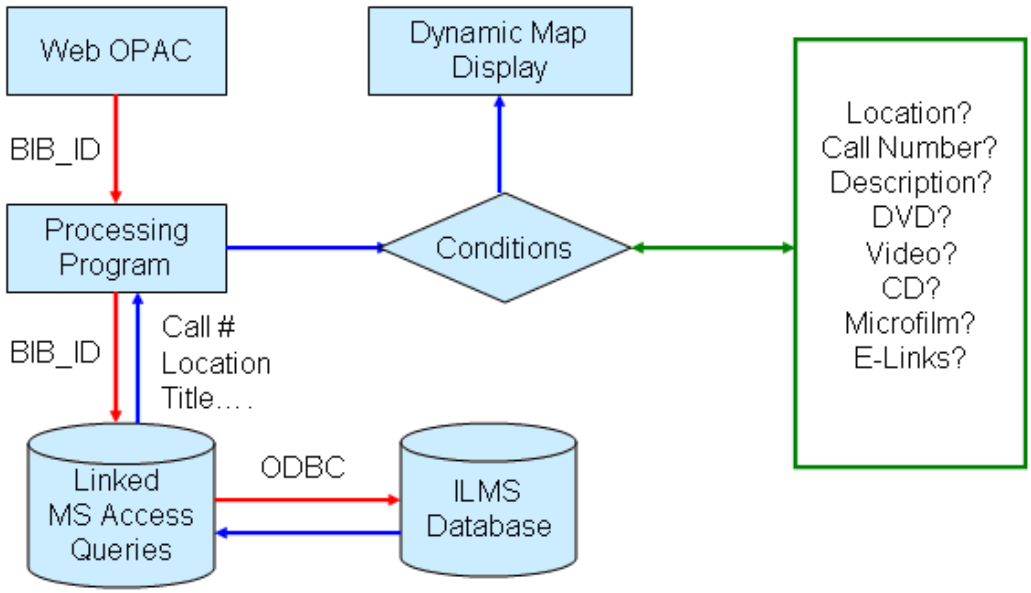


Figure 2: Diagram of data Processing Flow

Examples of the dynamic map can be found at: http://library.wichita.edu/techserv/catunit/dynamicmapExamples.htm.

4. Animated Map Creation

One librarian in the Technical Services created 16 maps based on different physical library locations and more than 40 maps based on call numbers. For call number with a small number of titles, such as LC classes "A", "V" and "Z" only one map identifying the first letter of that call number is created. For call numbers with large collections, different maps are created based on the first two letters of that call number, such as "P", "PR", "PS", "PT" and "PZ". For call numbers crossing two floors, two different maps were created. The animated maps are created using Adobe Photoshop 7.0 and Adobe ImageReady 7.0 programs.

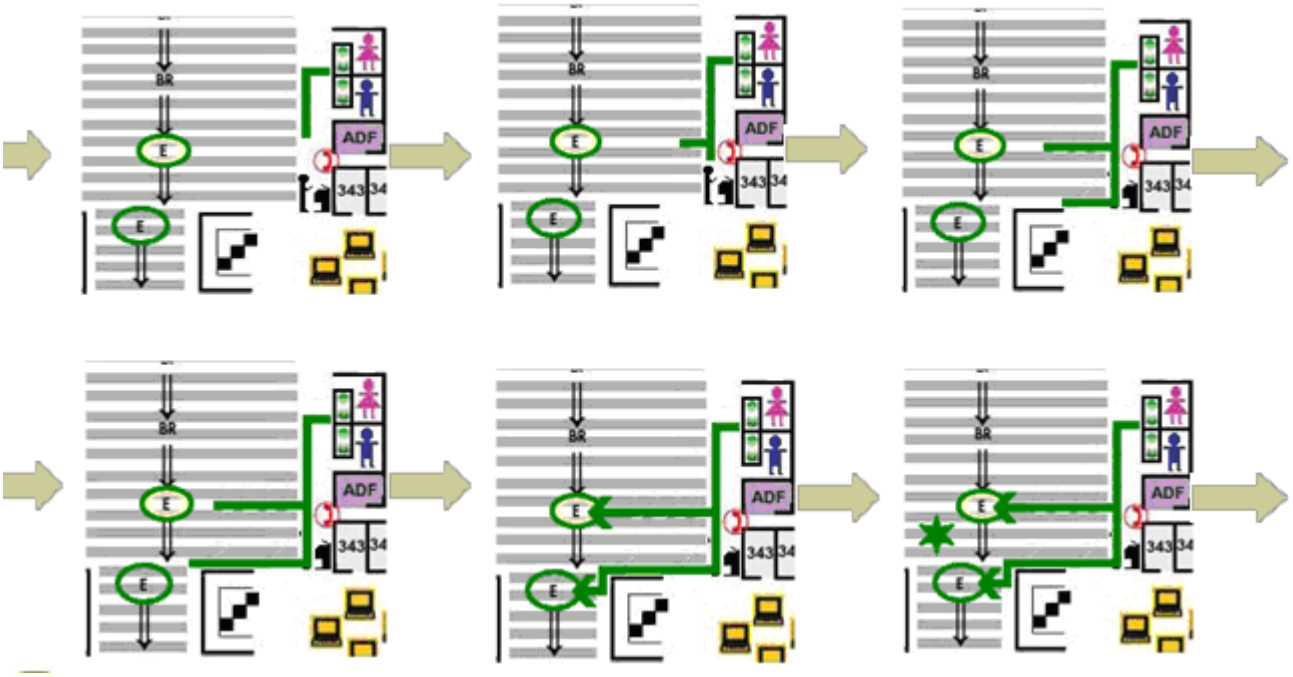


Figure 3: Creating Animated Effects

III. User Feedback

The dynamic maps created an instant "WOW!" effect. They were immediately popular since they showed different parts of the building or collections in more detail. The maps highlight "other available" copies. Directional questions are reduced because the maps "walk" people through the stack areas. The dynamic maps are perceived as "fun" by the users, especially the students.

The dynamic map project was introduced to the Voyager community in the last EndUser Conference held in Schaumburg, Chicago in 2007. The feedbacks are very positive, and many libraries showed interest in implementing a similar project in their libraries. More than 70 requests were received, asking for the code and implementation help after the conference. Currently, our System Developer Hongfei Li has put the code package and instructions in his blog (http://hongfei-li.blogspot.com). An invitation email will be sent to interested libraries, and the code can be downloaded upon request to Li at hongfeili@cityu.edu.

IV. Conclusion

With challenges from Google, Amazon and other information service providers, it is imperative for the OPAC to expand its functions by incorporating external data and services in order to retain its relevance to library users. Wichita State University's dynamic map project is an attempt to enhance bibliographic content by incorporating outside data to the webVoyage OPAC.

This project has implemented the map display to individual records level for the main stacks. Future possibilities include individual records map display in the branch libraries and Government Documents. One other prominent development in giving directions in the form of dynamic maps in a library is SmartLibrary. It is a "location-aware mobile library service"(Aittola, 2003) implemented in the main library of the University of Oulu. It can provide map-based guidance on a PDA on which users search the OPAC. It can draw the direction from the user's location to the floor where the book is located, but its guidance is still limited to floor plan maps. According to the study, SmartLibrary is a useful service for novice users. More experienced users may prefer the traditional shelf classifications (Aittola, 2004). To combine this feature with providing the direction for each individual record in the OPAC as implemented in the WSU Libraries could be a future possibility.

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