AC 2009-471: ACADEMIC LIBRARY INTERNET INFORMATION PROVISION MODEL: USING TOOLBARS AND WEB 2.0 APPLICATIONS TO AUGMENT SUBJECT REFERENCE

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Academic Library Internet Information Provision Model: Using Toolbars and Web 2.0 Applications to Augment Subject Reference

Abstract

This paper proposes a model that explains the way academic libraries provide information via the Internet. The model was developed by examining the way that researchers are required to conduct research using academic library web sites. A survey supporting the model was conducted of ARL member institutions. The survey examines usage of electronic resources by libraries. Another model is proposed for Google as a popular information provider. Differences between the two models are contrasted.

Fundamental differences between the two models led to the development and deployment of resources that better fulfill the needs of academic researchers. Topics to be discussed include subject specific toolbar applications, web 2.0 tools, and widgets. The tools that have been developed enable research and simplify use of library resources.

The faculty, graduate and undergraduate students at the Russ College of Engineering at Ohio University have been quick to adopt these new resources and utilize them for research. They have been consulted on the usage and implementation of resources and continue to make suggestions for improvements. Download and usage statistics indicate the usefulness of these tools.

Developing an Academic Research Model

There has been a lot of research about usability, design, and redesign of the library home page. In contrast there has been a dearth of research on the process of navigating the home page. What steps do libraries require researchers to take in performing the tasks of research? Jay Shorten analyzes academic libraries of the Association of Research Libraries (ARL)[1] and the actual structure that is utilized in academic library home pages to provide electronic resources on the Internet. The statistics that Shorten found differ from the results of the survey conducted for this paper this is to be expected however due to the time difference and the nature of the two surveys.

The creation of a process flow diagram explaining all the steps researchers are required to undertake to retrieve the information they need is a daunting challenge. Shorten found that there were 26 different electronic resources that the 114 surveyed libraries provided. An actual diagram detailing all the steps and processes would be unwieldy. There are too many components involved to create an accurate, useful diagram.

It is easy to distill the components into fundamental sets of resources and group them into categories that academic libraries provide to their patrons through the home page. The reference services that are focus on for the purposes of this model are the catalog, databases, services, and guided reference. The survey was conducted for this paper used a random set of 88 member institutions of ARL with a population of 114 possible ARL

institutions that are college and university libraries. This gives a 95% confidence level and a confidence interval of 5%. The focus of the survey was electronic resources that are provided by libraries for research that relate to the catalog, databases, and guided reference. Catalog and database components were checked to see if they were on the first tier of the library's home page. Guided reference was checked as an independent component. Other services (interlibrary loan, collections, digital collections, research guides, etc.) were not really measurable as all ARL member institution libraries provide some form of these.

The survey found that 100% of ARL institutions provide links to the catalog with 82.95% providing some method to search the catalog directly on the home page. The catalog is used to look for books, journals, electronic journals and many other resources. Some libraries have consortial catalogs which can be used to access items in the consortia. This adds an additional level of complexity to the catalog search.

ARL libraries provide direct links on their home pages to proprietary databases 95.45% of the time, and 44.32% provide direct searching methods. Database lists are provided 94.32% of the time and are found as hierarchical subject lists and alphabetic lists. Both styles of lists are large in scale as there are numerous databases that academic libraries are providing. Researchers are required to navigate these lists in three ways:

1. Alphabetic listings which require foreknowledge of the specific resource.
2. Hierarchical subject based lists require navigation by subject.
3. Searching a database that indexes research databases.

Guided reference involves services that are provided by libraries for patrons to receive direct assistance. Researchers pick the service that is comfortable to them and contact the library using it. A majority of ARL member libraries surveyed were providing e-mail (100%) and telephone reference (94.32%). This is not to say that telephone reference does not exist for 5.68% of ARL libraries; it just indicates that they do not advertise it as a service on the Internet. Chat-based reference is provided by ARL institutions in 89.77% of library web sites. There were four specific types of chat that were offered by member libraries. Client-based chat was in use at 34.09% of surveyed libraries; this service requires patrons to input data before it can be used. Widget-based chat used by 51.30% was divided into two types with 23.86% of libraries providing a wide assortment of proprietary widgets and 27.27% utilizing Meebo an Internet-based chat provider. Account based chat involves the use of AOL Instant Messaging, Yahoo, Google, ICQ or other specific messaging accounts for chat; 4.55% of ARL libraries were providing this service exclusively. Protected chat was provided by 3.41% of libraries and involves using a university or a college based ID and password to access the service. A lot of libraries provide account based chat services in addition to clients and widgets.

Miscellaneous services include everything from interlibrary loan, subject guides, writing guides, additional collections, etc. The problem with these resources is that there are a lot of them; they are dissimilar from each other, and hard to classify. Including these

resources on the home page increases the magnitude, scope, and complexity of the library's website. Proper arrangement of these pages is necessary to ensure usability.

One thing that is not included in the model is the 10.23% of ARL member institutions that are utilizing a true style of federated searching for resources. These federated searches allows for a broad based search of the catalog as well as other resources that are found within databases and other electronic collections provided by the institution. While federated searching is becoming a more viable search model it is not being utilized enough to be included in the proposed model. Another resource not included is text messaging or SMS services. It was found that 13.64% of ARL libraries are providing this service.
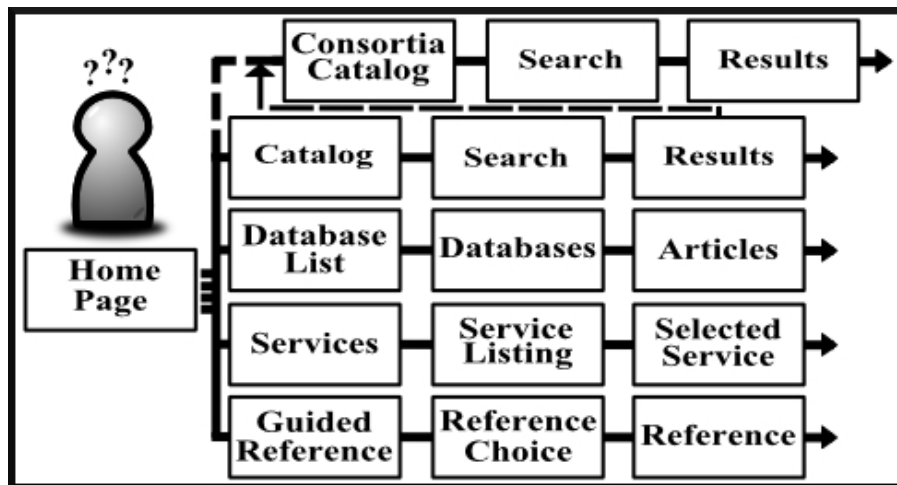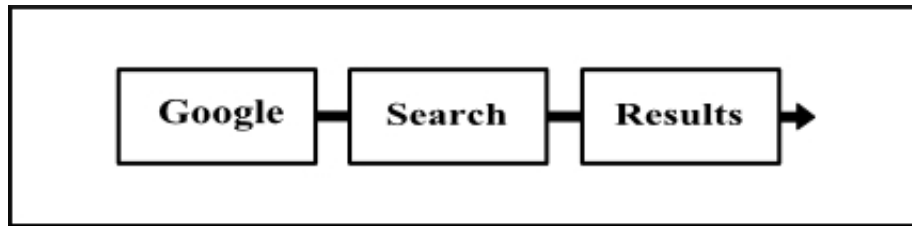

(Figure 1)

A simple academic library internet information provision model is shown in figure 1. The process flow diagram illustrates how a researcher starts at the home page and then navigates to the resource that they are interested in. With this fundamental model researchers are dependant on navigating the library's home page for required resources. They must follow specific steps that are different for each institution. Home pages have a limited area to display a myriad of resources. This restriction in size makes it difficult to prioritize and categorize necessary resources and increases the complexity of pages. Links to needed resources can require clicking paths that are convoluted. This means research instruction tends to require two broad steps:

1. How to find a resource on the library's home page
2. How to use the resource

Researchers Want Google

What researchers want is simplified searching. In the examples above, a researcher is required to navigate multiple steps to get to the resources they want to use. The number of paths to needed resources is large, unwieldy, and confusing. Is it any wonder that researchers get frustrated or tend to use other resources like Google? Google simplifies

searching so that there is a single search which gives instant gratification. It would be easy to ignore this.
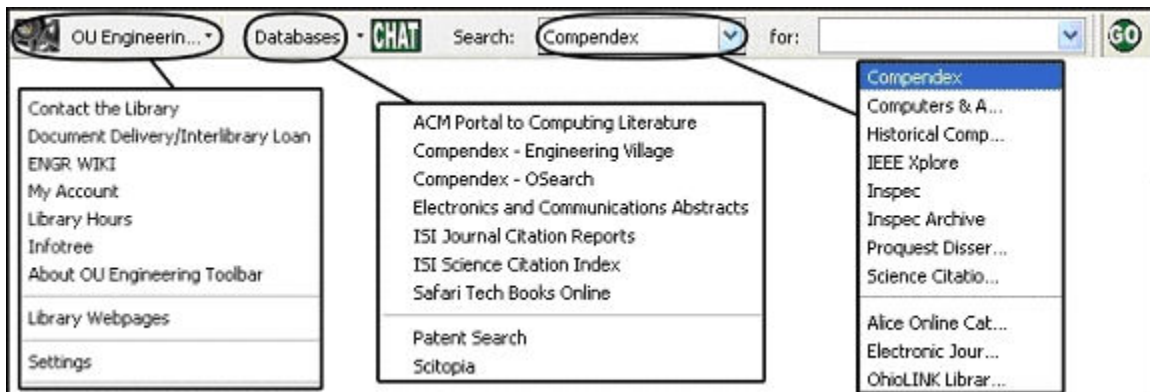

(Figure 2)

This is a difficult model to duplicate in a way that is efficient and worthwhile to researchers. Libraries should be wary of attempting to oversimplify this process. Google remains an inefficient searching style while the ease of use and immediate results are what attract patrons. However it would be irresponsible to ignore the fact that research model illustrated in figure 2 represents the researching method that has been ingrained into, and expected by researchers. Bernard writes about how websites should be constructed from the standpoint of what is expected by users[2]. Rather than go through the complexities involved in reconstructing the home page, solutions are needed that are independent from the problems.

The creation of tools that address the needs of researchers for streamlined searching is a ripe area for academic library development. There are a large number of advantages to research specific tools. Due to their malleability they can be designed to approximate the proposed Google model of research. They can be built to track statistics and thus provide metrics which can be used to determine whether or not there is justification to continue their development. If tools are created properly, they will not increase the complexity of the home page. Tools should not just duplicate the home page they should be tailored to the needs of their users. Why recreate a system that is already flawed and unwieldy?

Subject Specific Toolbars

The majority of work with toolbars to this date in academic libraries has focused on addressing the needs of the academic community in a college as a whole. These general toolbars mimic the library website and provide resources for the general population. One definite untapped market for toolbars is subject specific reference. Subject specific toolbars have the advantage of being designed for a specific population of researchers. By limiting the audience the needed databases, resources, and links are also reduced this decreases the required complexity of the tool. For general construction of a toolbar, Brown has an excellent article "Library Toolbars for Use and Development" that details toolbar resources as well as issues associated with toolbars[3]. Rice also wrote an article "Take the Library with You on the Web A Mozilla Firefox Toolbar"[4]. The toolbar that he constructed for the University of North Carolina - Greensboro served as the model for the Ohio University Engineering Toolbar.

In 2008 the Ohio University Reference and Instruction Department conducted a survey of 3648 students[5]. Seventy-Eight point four percent of the 2751 students who answered the question indicated that they would use a library toolbar if one was developed for Firefox or Explorer. For web browsing 42.4% of students preferred Mozilla Firefox, 42% preferred Internet Explorer, and 14% preferred Safari[6]. The engineering department expressed a preference for Firefox and that platform was chosen for deployment. A demo of the toolbar was shown to the chair of computer engineering for refinement. The chair asked for permission to share the prototype immediately with his department via e-mail. The next week he requested an instruction session showing how to use the toolbar to 22 faculty members. Within one calendar year the toolbar has been downloaded and installed on 134 different faculty and graduate student computers.
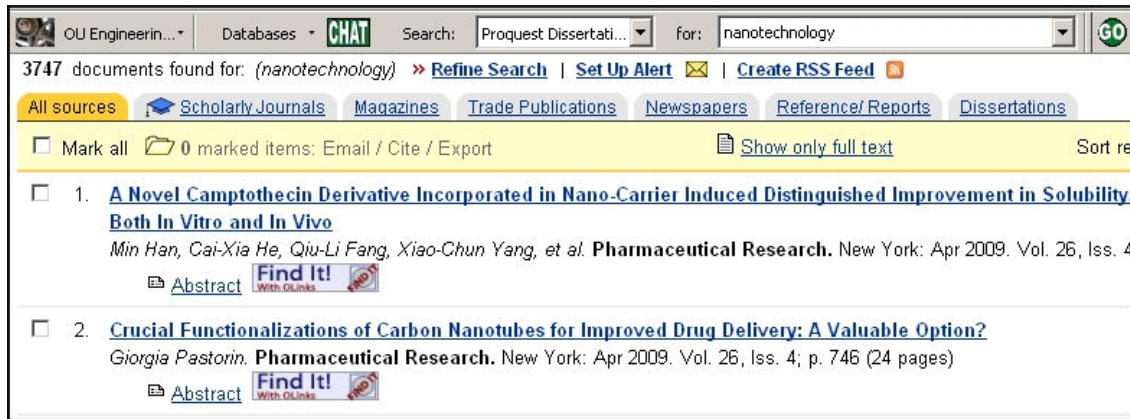

(Figure 3)

The toolbar, represented in figure 3, actually utilizes a Google style search for many databases and the library and consortial catalogs. Searches with the toolbar can be shown in the current window or be opened in a new tab. After the first search is run, researchers have the option of using the database in their web browser as normal. It authenticates the researcher via the proxy server when the first search request is sent to verify access to proprietary resources. Many databases are only searchable by MetaLib because vendors have not provided search URLs that are compatible with this model. MetaLib is an Ex Libris product that allows federated searching across multiple databases. In this case any database that can be searched via MetaLib at the present time can be enabled to be searched by sending a directed query to it via the toolbar. Federated searches can also be created so that multiple databases can be searched using this process. The toolbar also has direct links to those databases that do not allow for direct searching capability. Ochoa conducted a usability study that shows MetaLib can be confusing and difficult to understand[7]. Bypassing the native interface using MetaLib creates the need for additional instruction so researchers understand how to utilize both search interfaces.

The toolbar has a built-in chat button that utilizes a Meebo client so that faculty, students, or other patrons can contact the engineering librarian or the library. Meebo's chat widgets can be embedded in web pages. Clicking on the chat button opens a pop-up window in the browser that has a chat box embedded in it. To this date this separate engineering chat service has not been significantly utilized, averaging 2-3 engineering specific reference questions every month. In the period between January and February 2009 the service

spiked in usage averaging 11 questions in two months. More empirical evidence will need to be collected to measure the usefulness of this feature. Traffic to the engineering chat reference service cannot effectively be measured as it could be coming from additional widgets embedded on an engineering wiki (ENGR Wiki), a blog (thecodinglibrarian.blogspot.com), and additional resources.

(Figure 4)

Figure 4 shows the toolbar in action searching for the term nanotechnology in ProQuest Dissertations and Theses. From a structural perspective the toolbar has the advantage of being streamlined, subject focused, and convenient in location. Placing tools within the researcher's web browser makes them easier to locate. From a coding standpoint the choice of Firefox 3 has been ideal as Mozilla requires secured automatic updating features be used for the application to work. Whenever a patron starts the toolbar on their individual computer, it checks with the update file (housed on the home server), and if a new version of the toolbar is available it makes the update available for automatic installation. This functionality ensures that security updates, link repairs, and other necessary changes are carried out and that the toolbar continues to function.

Libraries that are interested in their own toolbar projects will need to address required resources as well as plans for continued maintenance. Ongoing support for the OU Engineering Toolbar has been simple to this date; however, the concept, development, deployment, and maintenance are handled by the author of this article. Discussions with other libraries that provide toolbars highlight that this seems to be a unique situation as most often toolbars are either constructed by committee or through collaboration with the local systems department.
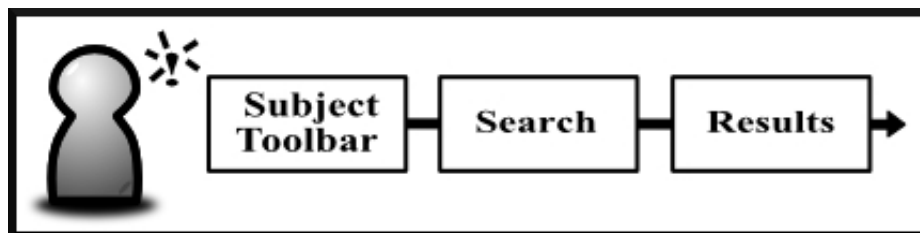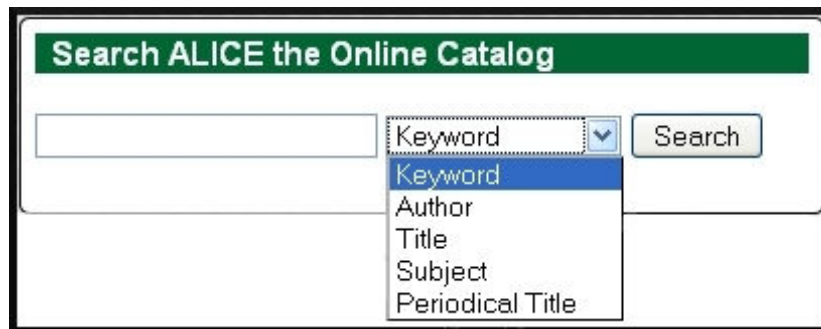

(Figure 5)

Toolbars are excellent resources creating a small, tailored, subject specific research portal that holds the tools and resources a particular researcher in a discipline would need. The subject toolbar information model (figure 5) has the ability to provide an information structure that is very similar to the hypothetical Google model. Reference instruction to patrons in engineering is shifting from being equally focused on navigating the library home page and database resources, to include utilization of the toolbar to get to resources. Alden Library is examining extending the toolbar project to include several other disciplines in the sciences and has an internal specialized research toolbar designed just for staff.

Subject Based Widgets for Researchers

Meier discusses how widgets can be used to augment chat reference services as well as subject specific reference[8]. Boule discusses specific Web 2.0 tools that can be utilized by libraries[9]. Meebo based chat widgets are being used by Ohio University Libraries as the general chat service as well as the subject specific chat. For instance, there is a chat link built into the engineering toolbar that is discussed above, as well as on a subject Wiki portal. ARL institutions are gaining experience with widgets; 13.46% of ARL institutions include widgets on their home pages and 51.3% of chat services that are in use are widget driven.

The next obvious step is to create tools that are not dependant on being installed in specific web browsers. Widgets can be adapted, they are malleable, and they are not browser-based; this makes them a perfect vehicle for next generation library web applications. In some ways they may be more sustainable, since applications can be created with widget hosting services on a departmental account. This makes them easier to maintain. All the components of the widget are located with the service instead of spread around in various files and directories on the programmer's computer or on the server. Why not use widgets to impart the same kinds of functionality that can be delivered via toolbars or create new tools and resources that can aid researchers? There are a lot of different libraries that have already created these types of widgets including Ohio University Libraries. Figure 6 shows an example of a working catalog search widget that was simple to construct.

(Figure 6)

Conclusion

Today's academic researchers continue to cope with the specific information provision models that libraries provide for them on the web. The Google information model is what researchers would prefer to work with; it is simple and easy to use. New tools are being developed that attempt to address this research need while providing an additional resource that researchers can utilize in their specific fields of study. Toolbars and widgets allow the use of a streamlined, less confusing, information provision model in the fulfillment of information needs. These tools can accomplish this without adding additional layers of complexity to the existing library home page.

Acknowledgements

Appendix A

Explanation of statistics gathered. To approximate a 95% confidence level for a population of 114 Association of Research Libraries that are college or university libraries with a confidence interval of 5% requires a sample size of 88 libraries. For this study 88 ARL member institutions were selected randomly.

Component	Libraries	Percentage	Notes
Federated Searching	9	10.23%	Located on Home Page
Library Catalog	88	100.00%	Located on Home Page
Catalog Search Box	73	82.95%	Located on Home Page
Databases Link	84	95.45%	Located on Home Page
Database/Article Search Box	39	44.32%	Located on Home Page
Databases Listed Alphabetically	83	94.32%	Anywhere in Web Site
Databases Listed by Subject	83	94.32%	Anywhere in Web Site
E-Mail Reference	88	100.00%	Anywhere in Web Site
Telephone Reference	83	94.32%	Anywhere in Web Site
Text a Librarian	12	13.64%	Anywhere in Web Site
Skype a Librarian	2	2.27%	Anywhere in Web Site
Chat Provided	79	89.77%	Anywhere in Web Site
Other Client (requires data from users)	30	34.09%	Anywhere in Web Site

Widget Based Chat (non-Meebo)	21	23.86%	Anywhere in Web Site
Meebo Based Chat	24	27.27%	Anywhere in Web Site
Account Based Chat (AIM/ICQ/Google/Yahoo/MSN)	4	4.55%	Anywhere in Web Site
Protected Chat (Account/Password)	3	3.41%	Anywhere in Web Site
Widget Components	12	13.64%	Located on Home Page

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