Evolving Web, Evolving Librarian

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Introduction

The information landscape has changed dramatically over the past ten years. The World Wide Web (WWW) has had a major impact on how librarians and library users alike access information. New developments in technology have occurred that have moved us from the early web to Web 2.0. As the web evolves, so too must librarians. In the ever-changing environment that is the web, it is critical to stay abreast of technical developments, as well as user behavior and expectations. Now it is time to consider how librarians can take advantage of these new developments and help their libraries to evolve in a similar direction.

Web 2.0 is a term that has been used to label new web technologies (O'Reilly, 2005) that allow users to create, personalize, and share information in ways that were not possible a few years ago. These technical developments include blogs, wikis, and web sites such as Flickr (a photo sharing site), MySpace (a site for watching and sharing original videos). The use of these sites is continually growing. According to a June 2006 comScore Media Metrix report, MySpace saw over 51 million unique visitors in May 2006. YouTube had over 12 million visitors and Flickr welcomed over five million[1]. The popularity of these sites indicates a real interest in the ability to share and communicate with others who have similar interests.

Over the past five years the evolution of the web into Web 2.0 has been shaped by four major trends that have acted as primary drivers of the ever-evolving information landscape. These drivers not only affect the high-tech sector, but the consumer technology sector as well. Their influence can be seen in countless web-based services, computer hardware, software, handheld devices and cell phones:

- Personalization.
- Self-service.
- Mobility.
- Technology.

As new technologies and information services become available and popular, user expectations evolve along with them.

User expectations

Thanks to web sites such as Google, Amazon, eBay, and others, users of the WWW, especially younger people, have come to expect a different kind of experience when they interact with the world of online information. Google's search interface is a perfect example of some of the changes that have occurred. Compared with the Lexis/Nexis or Dialog search screens of ten years ago, a Google search is simplicity itself. There is one box-type in a few words and go. There is no need for instruction, complicated search protocols, or an intermediary. Speed is another key element of the new web experience. Google searches billions of web pages in a fraction of a second. And people expect that the answer they seek will be the first link, or at least "above the fold." While the link a user selects might not be the best in the best of all possible worlds, it is generally close enough to satisfy most people in most cases. The simplicity, speed, and satisfaction of this experience have helped to drive user expectations in all their interactions with information on the web.

Personalization

Users have also come to expect to find information in an environment tailored to their personal needs and interests. Amazon serves as a good example of the personalized web experience. When users search for a book on Amazon, they get not just author, title, and a few subject terms, but also links to editorial reviews, the ability to browse sample pages, and a list of other books cited within the work. Based on a customer's past search history and aggregated purchasing data from other customers, Amazon proposes similar or related materials that a person might enjoy in the hopes of stimulating additional interaction with the site.

Personalization and customization of information continue to be a challenge for libraries. Librarians have been staunch defenders of their patrons' right to privacy and have implemented procedures which protect users' reading and search histories. It may, however, be time to seek a new balance between information privacy and service. When interacting with the commercial web, our patrons accept, and in many cases embrace, the need to share personal information in order to receive personalized service. Libraries could allow users to create identities and profiles that, given the right technology, could be used to tailor a patron's view of library content and services. Based on user profiles or accounts, library systems could recognize patrons and adapt search results and content alerts to their unique search and borrowing history and expressed interests. It will be necessary, of course, to continue to safeguard patron privacy, but ideally within a context that allows options for personalized information services. As searching the entire WWW becomes an experience tailored to the needs and interests of individuals, library users expect the same kind of experience when they visit the library's information space.

Some libraries have sought to personalize the look and feel of their web sites by creating portals to information services. One example is MyLibrary at North Carolina State. With MyLibrary, users can create a personalized interface to the information resources available at the North Carolina State University Libraries. Although the site has been available for the last six years, it does not offer personalized information services beyond current circulation and request status, and links to course materials.

One area in which libraries have been making great progress by taking advantage of new technologies is in providing customized content in the form of really simple syndication (RSS) feeds to users. RSS is a process that uses readily available software to automatically deliver web content to registered users. A fine example can be found at the Georgia State University Library. Here users can choose from 20 separate feeds broken down by academic discipline. Giving users the option to receive only the information on topics that interest them is an important first step in personalizing the library user's experience.

Personalization is taken to the next level as users of major web sites are encouraged to contribute their own content. For example, users of Amazon can contribute their own comments, reviews, or suggestions about books, movies, and CDs. They may also create their own tags. Tags are keywords, or categories that label content users may want to return to in the future, or that help other users find similar or related content. Sites that provide a means for users to share, and tag content with others such as Flickr, MySpace, and del.icio.us, have seen particular growth in the past couple of years. Del.icio.us, for example, provides participants with a means to share links to their favorite content on the web with friends and family, but also with a broader community of people around the world. Users can identify others with similar interests, explore the most popular tags, or view recent additions. Based on the growing popularity of these types of sites, it appears that there is a real interest in sharing personal content and information and finding and communicating with like-minded people in a world-wide community.

Libraries have not traditionally offered patrons the opportunity to contribute content to their catalogs, but that is changing. OCLC, Inc. has recently added a feature to the public interface of their WorldCat database. Registered users can add comments and reviews to the existing bibliographic data for any resource in the catalog. This capability increases user-to-user communication and builds a sense of community around the library's collections.

Communities can also be built around information shared through blogs. Blogs are personalized web sites through which individuals can share anything from their thoughts on world trade to what they had for dinner the night before. Blogs also create community in a number of ways. Although the posts themselves generally come from one person, or institution, readers can create a dialogue through comments on posts, and, via RSS, the content of blogs can be easily tracked as it is updated.

The web is overflowing with great examples of innovative and dynamic blogs created by all types of libraries. A title search on the Google Blog Search site for the word ''library'' yielded over 250,000 results. With the increasing popularity of free, hosted blog solutions such as Blogger and Livejournal, the barriers to blog creation are non existent. It is no longer unusual for the local pubic library to publish several blogs tailored to specific audiences or topics such as children, young adults, and adult reader services. One example can be found at the Darien Library, Darien, Connecticut. Here the library publishes eight blogs devoted to specific groups such as teens and children as well as topics like movies, town events, and even books.

A more ambitious blog application can be found at the University of Minnesota Libraries with their UThink blog site. In this case, the library provides faculty and students with an account where they can have access to what is in effect a blogging sandbox. UThink is a free area where students and faculty can create blogs related to classes as well as personal interests. The result has been the creation of a vibrant, ever-changing community of bloggers. After one year in existence on April 12, 2005, the site had over 2,220 registered blog authors creating over 17,645 individual entries. In addition, these entries generated over 12,486 comments[2].

Wikis offer a more collaborative option for communities to share information. Wikis allow users to directly contribute to, and edit content on a web site. A community of users may build content around a single topic such as music resources, or create content around a conference or event, such as occurred for the American Library Association's Annual Meeting in Chicago in 2005. A wiki example that many people are familiar with is Wikipedia. Wikipedia bills itself as a ''free encyclopedia that anyone can edit.'' Anyone, anywhere in the world can contribute his or her expertise to this resource by adding or editing entries. In this way, individual contributions from members of a community combine to create a larger, potentially more valuable resource than any one person or institution could. Contributors work together as a self-policing community to monitor entries for quality and appropriateness.

The use of wiki technology in the library has not been as widespread as blogs, perhaps because up to now there has been a lack of free hosted solutions such as are available to bloggers. This lack of options has recently changed with the launch of PBWiki and Seedwiki. Both sites offer free versions of wiki software that is user-friendly and does not require any programming experience to implement or use.

The relatively few (compared to blogs) library-related wikis that can be found are, in most cases, works in progress. Neither the Library Success Best Practices Wiki, nor the Library and Information Science Wiki contain a great deal of content yet, however, creating connections and building a community of library professionals might be just as important as creating a definitive resource. No doubt, moving forward the number of people who contribute will grow, and with it the quantity and reliability of the content.

The value of all types of content and data is beginning to be realized and exploited in interesting ways by numerous web sites. The Internet Movie Database (IMDB) now requires

users who want to read the message boards for a movie to register first. IMDB does not charge people to register, but through the registration process they gain information about users of their site, and their behavior on the site. This information can, in turn, be used for trend analysis and to deliver advertising to targeted audiences.

Google Maps makes it possible for anyone with the right technical skills to build additional services that make use of the same map data. One such example is called GMaps Pedometer, a site that lets a person zoom in on any Google map and plot and measure a walking or running route. The site even includes a calorie counter to calculate the number of calories burned on a particular route, for example. GMaps is a fine example of using simple tools and open access to data to add value rather than keeping data in proprietary silos that deter innovation.

Libraries need to liberate the valuable data locked in their catalogs and use today's technologies to share it with and integrate it into other information sites and services. Libraries' digital resources are often left out of Google search results because of the way they are delivered to the web. Consequently, these library resources are generally accessible only to those who know where to look for them. OAIster, a project of the University of Michigan Digital Library Production Service, uses the Open Archives Initiative Protocol for Metadata Harvesting to aggregate metadata for 7,605,729 items from 647 institutions as of the writing of this article. People who search OAIster enter their search term once to discover content from hundreds of institutions, many of which they did not even know existed. Using freely available software tools, libraries can convert their cataloging data into the format required for harvesting and contribute it to this, or other aggregator services. To further integrate this information resource into people's information space, OAIster offers a search engine plug-in for the Firefox browser toolbar.

OCLC, Inc. has taken the challenge to make their existing data work harder very seriously. They have made data from WorldCat, the world's largest database of bibliographic information[3], available to Google and Yahoo, through a program called Open WorldCat. When a person enters a search for a book title in Google or Yahoo the results may include a link to find the book in a library. As part of the service, a user enters his or her zip code to find a copy of the book in the nearest library. Some libraries provide links from this site directly into their catalogs, which can provide the searcher with actual circulation information.

Libraries could take a page out of Google or Amazon's book and begin to allow users to create personal information profiles and develop systems that would make use of this information to customize the way library patrons view, discover, and interact with library content. In a world where portable personal library profiles exist, a searcher could complete the search for a book located via Google through the library by placing a direct ILL request, or by ordering delivery of an item to his or her home, no matter what his or her library affiliation. However, unlike Google and Amazon, libraries tend not to make use of patron-specific information to deliver targeted information services. Their tradition of protecting user privacy has prevented them from collecting and using both patron-specific and unassociated aggregated patron information to assess trends, identify hot search topics, and connect communities of users. By adjusting policies and practices, and adopting new technologies, a library's services could come to more closely resemble the services offered by commercial vendors and become serious players in the online information space. The demand for this type of interaction exists based on the popularity of these other sites, as does the technology to make it happen, but the question remains whether librarians will adapt their services to meet changing expectations.

Self-service

In the marketplace that is the WWW, the doors never close. A host of online storefronts enable customers to carry on transactions that for decades required the help of trained service professionals. It is now common for people to directly apply for loans, book travel arrangements, purchase tickets, get questions answered, make appointments, and pursue degrees online. And all of this self-directed commerce is carried out 24 hours a day, 365 days a year.

The impact this has had on user expectations is predictable. People have become accustomed to, and have grown to expect, that they will be able to perform more and more activities on their own over the internet. Libraries need to recognize this expectation and make library services simple to use without complicated instructions, or recourse to a library staff member. Librarians need to remember to make it possible for users to complete tasks they want to complete simply, and without assistance whenever possible.

Mobility/technology

Another trend that cannot be overlooked is the explosion of devices that make access to information in many forms available anywhere anytime. Mobile devices such as Personal Digital Assistants (PDAs), cell phones, smart phones, and laptops coupled with the nearly ubiquitous connectivity of WiFi and cellular service, give users the ability to access information wherever they are, whenever they want it.

With the increased prevalence of cell phones and handheld devices in every area of life, integrating library information into patrons' world will involve going mobile. There are a number of approaches libraries can take. One method is to provide access to information content that is formatted for mobile devices. These devices often sport very small screens, text entry without a standard keyboard, and little internal memory. Ideal formatting features include short, easy-to-read pages to minimize scrolling, minimal images, and easy navigation such as numbered links for cell phones. In addition to pointing library patrons to Web sites that provide content specially formatted for mobile devices such as Google Mobile, MapQuest, Westlaw, Ovid, and BBC News, some libraries have taken the next step and are providing their own library interface in a mobile-ready format. Ball State University Libraries received a grant from the Institute of Museums and Library Services under the provisions of the Library Services and Technology

Act (LSTA), to develop content that supports their students and faculty on the go. From their mobile web site, users can access reference links, the library's catalog, book locations, mobile journals, nursing instruction videos, and other content designed for mobile devices.

The Minneapolis Public Library has implemented Innovative Interfaces, Inc.'s AirPac which provides a mobile-friendly interface to their public catalog. Both simple and advanced levels of searching are available through a clean, text-based interface. Dropdown lists with search types and search limits make it easy to interact with the service, even with limited text-entry capabilities of mobile devices. The addition of circulation information and book locations in the library take advantage of the mobility of the device and add another degree of self-sufficiency to the transaction. Libraries may want to consider providing access to circulation records, book due dates, overdue notices, and ILL requests via cell phones and handhelds to better serve their mobile patrons.

Conclusion

All of these examples serve to demonstrate a significant shift in how the web and information on the web is being used. The cool sites no longer simply present information as a set of static web pages. The drivers of personalization, self-service, mobility, and technology becoming smaller, cheaper and faster have created a web-based environment where users interact with, contribute to the creation of, share, and personalize the information content in their world. In many applications the web now recognizes users, remembers past activity, and even anticipates future activity and need.

The information sphere is changing, creating a growing number of users with ever higher service and access expectations. Libraries need to address changing user expectations for a personalized, easy-to-use information experience that integrates into their lives on any device wherever they are and whenever they need information. Librarians need to learn about and adopt new technologies to help the library evolve into a new information space. To help users become more self-sufficient, the role of the librarian must expand. As more content is delivered to the desktop and handheld devices, the need for expertise to manage the flow of information will be critical. The good news is that over the past 40 years librarians have demonstrated a remarkable ability to identify, understand, and integrate new technology into the library landscape. In a real sense, the state of the evolving librarian is not a new condition, but rather a continuation of what librarians have always done.

NOTES

1. *Social Networking Sites Continue to Attract Record Numbers as Myspace.Com Surpasses 50 million US Visitors in May*, comScore Media Metrix report, June 2006 (www.comscore.com/press/release.asp?-press=906).
2. *UThink: Blogs at the University Libraries General Archives*, April 15, 2005, viewed June 30, 2006 (http://blog.lib.umn.edu/archives/cat_general.html).
3. *WorldCat: Window to the World's Libraries*, viewed June 30, 2006 (www.oclc.org/worldcat).

REFERENCE

O'Reilly, T. (2005), *What Is Web 2.0?: Design Patterns and Business Models for the Next Generation of Software*, September, available at: www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

LINKS TO SITES MENTIONED

ALA Chicago 2005 Main Page: http://meredith.wolfwater.com/wiki/index.php?title=Main_Page

Amazon.com: http://amazon.com

Ball State University Libraries Mobile Page: www.bsu.edu/libraries/mobile/

Blogger.com: www.blogger.com/start

Darien Library web site, Darien, Connecticut: www.darienlibrary.org/

Del.icio.us: www.flickr.com

Functional Requirements for Bibliographic Records (FRBR): www.ifla.org/VII/s13/frbr/frbr.pdf

Georgia State University Library RSS Feeds: www.library.gsu.edu/news/

GMaps Pedometer: www.gmap-pedometer.com/

Google: http//google.com

Internet Movie Database (IMDB): http://imdb.com/

Library and Information Science Wiki: www.liswiki.com/wiki/Main_Page

Library Success: A Best Practices Wiki: www.libsuccess.org/index.php?title=Main_Page

Livejournal.com: www.livejournal.com/

Minneapolis Public Library AirPac: http://mplwebcat.mplib.org/airpac/jsp/airpacIndex.jsp

MyLibrary at North Carolina State: http://my.lib.ncsu.edu/

MySpace: www.myspace.com/

OAIster: http://oaister.umdl.umich.edu/o/oaister/

Open Archives Initiative Protocol for Metadata Harvesting: www.openarchives.org/OAI/openarchivesprotocol.html

Open WorldCat: www.oclc.org/worldcat/open

PBWiki: www.pbwiki.com

Seedwiki: www.seedwiki.com

UThink: Blogs at the University of Minnesota: http://blog.lib.umn.edu

Wiki WorldCat (WikiD) Pilot: www.oclc.org/productworks/wcwiki.htm

Wikipedia: http://en.wikipedia.org/wiki/Main_Page

YouTube: www.youtube.com/

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