Time for a change: new approaches for a new generation of library users

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Abstract

Purpose – The purpose of this paper is to offer some insight into changes that are occurring in the expectations and behaviour of researchers seeking scholarly information and the ways in which libraries and vendors are addressing these changes in light of the availability of Web 2.0 technologies.

Design/methodology/approach – The paper investigates current trends in information seeking, defines and describes factors that contribute to an up-to-date, user-centric library experience, and examines the movement of vendors and libraries toward such a library experience.

Findings – The paper identifies aspects of new library interfaces that attempt to satisfy the needs of today's information seekers and describes a new approach for creating a user experience layer for library collections. The Primo® discovery and delivery system from Ex Libris serves as an example of a library interface that was designed in light of this new approach.

Originality/value – As more organisations become concerned about the decreasing use of their library collections, this paper suggests ways in which libraries can adapt to the changing user expectations and maintain the relevance of their collections and services for today's information seekers.

Keywords Libraries, Library users, Computers, Worldwide web, Design

Paper type Technical paper

Introduction

Since the mid-1990s, the expectations and behaviour of library users have been undergoing a major change. The widespread adoption of web search engines and other internet tools and services and the emergence of players such as Google Scholar and Windows Live Academic in the scholarly information-retrieval arena have reduced users' dependence on library support to fulfill their information needs. The introduction of technologies that are Web 2.0 oriented has added an element of fun to the user experience; moreover, these technologies expose users to informally published materials produced by colleagues and promote the sharing of digital materials and user expertise. Although users still consider library resources much more trustworthy and credible than web search engines, internet encyclopaedias, and other freely available web services, the typical information seeker is attracted to the ease of use and the online availability of content that the latter resources provide (OCLC Online Computer Library Center, 2005).

Faced with competition in what used to be their exclusive domain, libraries are looking for ways to adapt to a changing world and keep their services relevant for today's information seekers (University of California Libraries Bibliographic Services

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Task Force, 2005; Calhoun, 2006). Librarians realise that not only do their systems need to offer better discovery tools, but also, to address users' needs adequately, the systems must supplement the discovery process with precision delivery tools. Furthermore, libraries need to make the research process engaging and integrate it into users' normal workflow.

In light of the expectations of today's information seekers, how can libraries provide a user-centric library experience that embraces familiar features and library-driven methods and that is incorporated into the larger context of tools and services?

User spaces

In October 2006, Google announced the acquisition, for $1.65 billion, of YouTube (www.youtube.com), a company that was founded in February 2005 and offers an internet platform for watching and sharing video clips (Google Press Center, 2006). The success of YouTube is evident: according to the company's web site, YouTube plays 100 million videos per day, and more than 65,000 videos are uploaded daily. *Time* magazine selected YouTube as its 2006 invention of the year, because "... only YouTube created a new way for millions of people to entertain, educate, shock, rock and grok one another on a scale we've never seen before" (Grossman, 2006). Although YouTube members use the videos mainly for entertainment, the site's popularity can be attributed to factors that are also relevant to academic research – primarily, YouTube's design as a collaborative platform that enables a community not only to share information but also describe it and publish it in a manner that is most relevant to its members.

The recent success of YouTube does not come as a surprise. In late 2005, a report by OCLC Online Computer Library Center on the perception of libraries and information resources revealed noteworthy patterns of information-seeking behaviour, patterns that have considerable implications for libraries' future directions (OCLC Online Computer Library Center, 2005). The report analyses the results of a survey of more than 3,300 respondents aged 14 to 65 from Australia, Canada, India, Singapore, the UK, and the USA. A companion report, focusing primarily on the perceptions of college students at the undergraduate and graduate levels, was published in April 2006 (OCLC Online Computer Library Center, 2006).

Only 2 per cent of the surveyed undergraduate and graduate students state that they begin their search for information on a particular topic at the library's web site, despite the fact that 61 per cent have used the library web site at least once and 85 per cent rate the online library as a favourable resource. Furthermore, 77 per cent believe that the library resources (online and physical) are trustworthy or credible, and 76 per cent describe them as accurate (only 23 per cent describe web search engines as trustworthy and credible, and 24 per cent consider them accurate). Most of the students (75 per cent) agree that librarians add value to the information search process.

When the students were asked about internet tools and services such as web search engines, e-mail, instant messaging, online news, online bookstore, blogs, and RSS feeds, their answers indicated that many are familiar with and use most of these tools – primarily e-mail, web search engines, and instant messaging. On the other hand, more than 50 per cent of the students replied that they were not aware of their library's e-book collection, and only 62 per cent were certain that their library offers online databases and e-journals. When asked which resource they turn to first when they are

looking for information, 89 per cent of the students indicated web search engines, 2 per cent indicated online databases, another 2 per cent indicated their library's web site, and the rest indicated other internet tools and services.

The students surveyed by OCLC consider web search engines faster (90 per cent), more convenient (84 per cent), and easier to use (87 per cent) than the online or physical library. An examination of the increasing popularity of the new, Web 2.0-oriented tools such as YouTube reveals where users are flocking – for example, in February 2007, del.icio.us (http://del.icio.us) announced that it was serving one and a half million registered users, half a million more than it served in September 2006 (Schachter, 2007). MySpace (www.myspace.com), with more than 100 million users and a billion entries per day, was second only to Yahoo in the number of daily page views as of August 2006 (Sellers, 2006). Services such as Flickr (www.flickr.com), with 4.5 million registered users (Arrington, 2006); Facebook (www.facebook.com), with more than 10 million registered users (Facebook, n.d.); Connotea (www.connotea.org); and CiteULike (www.citeulike.com) are engaging users at an increasing pace.

Librarians need to understand better why users prefer other sources of information despite their respect for and trust in the library's resources. This change in users' perceptions and their preference for internet tools and services such as web search engines, e-mail, blogs, and RSS feeds are the outcome of several factors.

First, users assign great value to the ease of use, ease of access, and speed that characterise internet tools and services. Although web search engines may lack the options available through library catalogs and scholarly databases and may be less accurate, the web search engines are more fun to work with, offer immediate satisfaction, and are easy to learn to use. Furthermore, users tend to prefer online materials whenever possible and consider web tools more appropriate for finding and obtaining online information. Some web search engines are even starting to adopt or develop library-like features, such as OpenURL awareness and the refinement tools of Google Scholar (http://scholar.google.com), but provide them in a user-friendly way to suit the expectations and expertise of the projected target audience.

Another factor that has influenced users' research habits is the availability of integrated search environments (such as those offered by web search engines). Such integrated environments cover a broad spectrum of information, as opposed to "a fragmented set of systems [that enable users] to search for published information (catalogs, A&I databases, full text journal sites, institutional repositories, etc.) each with very different tools for identifying and obtaining materials. For the user, these distinctions are arbitrary" (University of California Libraries Bibliographic Services Task Force, 2005). Although libraries partly address the problem of a fragmented research space by offering metasearch systems, these do not yet provide a user experience with the coverage, performance, or ease of use that the web search engines provide.

Another aspect that plays an important role in setting users' expectations is the emphasis that the new internet tools and services place on the user in adherence to the Web 2.0 design concepts: users are the focal point, and the services are built around them. Such user-centric design goes all the way from tailored toolbars to a "mashup" of services, that is, to "a Web site or application that seamlessly combines content from more than one source into an integrated experience" (Cho, 2007). Current library systems, on the other hand, are typically disconnected from user spaces and expect

some effort on the part of the user to access library collections. Libraries are only starting to explore similar directions, as demonstrated by the Talis "Mashing up the Library" competition (Talis Developer Network, 2006). The Go-Go-Google-Gadget, which won first prize, demonstrated "how simply library information can be integrated into the personalised home page offered by Google" (Talis News Archive, 2006).

Last, but not least, is cyber-interaction. The wide adoption of and participation in social computing services such as Flickr, YouTube, and de.licio.us indicate that users consider the internet a meeting place that enables them to exchange scholarly and non-scholarly information; they are happy to share their knowledge with others and benefit from others' knowledge. Users appear to be constantly seeking more intuitive and pertinent ways of describing content that they find so that the content will be easier to use later.

What can libraries do to support their users?

Indeed, libraries may not measure up to the prevalent internet tools and services when it comes to speed, simplicity, and convenience. However, if libraries manage to create a more satisfying user experience, they may very well regain their leadership as providers of scholarly information, because they enjoy several important advantages over the internet tools.

First, libraries offer quality information resources that librarians have carefully selected to meet their users' needs. Hence, search results are likely to be more relevant, and, even more important, users can rely on the quality of the results. On the other hand, users trying to locate information via a web search engine might enjoy instant gratification, but they might also find themselves engaged in a long and frustrating process of finding a needle in a haystack. Furthermore, there is no guarantee that what they find is considered trustworthy.

Not only can a library designate a spectrum of authoritative scholarly information, but it can also offer slices of such information to individual users on the basis of their affiliation and personal preferences. The information spectrum can include resources that the library controls, such as the catalog, local digital repositories, course management systems, and institutional web sites; it can also include remote resources, such as abstracting and indexing databases, e-journal collections, and subject gateways. Unlike librarians, users are not aware of whether a resource is locally hosted or remotely hosted, free or licensed, MARC formatted or Dublin Core formatted, so libraries need to create an integrated, coherent environment that renders these distinctions invisible to the user. On the other hand, users are well aware of the distinction between physical and online materials and typically prefer the latter. As most materials that libraries offer are still physical materials, the great majority of which are not available in other forms, libraries can promote their physical collections by providing better ways for users to find out about them and explore them.

Furthermore, users do not search for the sake of searching; they search to find and obtain information. An internet search can easily lead to frustration because the items may prove to be untrustworthy and delivery is not guaranteed. Distance can render physical items unavailable or even undeliverable, and online items can be inaccessible because the web site that cites them does not provide a link to the electronic version or provides a link to a copy that is not "appropriate," that is, not licensed by the library (Van de Sompel and Beit-Arie, 2001). Libraries, however, can usually obtain a copy for the

user, regardless of where it is or whether it is physical or electronic. Taking advantage of current technological capabilities, libraries can, and should, offer a clear statement of an item's availability and the means for obtaining it. According to the recommendations presented in a report commissioned by the University of California, the future software interface for libraries should "provide an 'I-want-this' button that is present when the context warrants, with the goal of always offering a fulfillment option. No dead ends" (University of California Libraries Bibliographic Services Task Force, 2005).

One of the main challenges in offering any kind of scholarly search interface is to make it as familiar and intuitive as the one used by web search engines and other internet tools but to guarantee that it yields better results. "Better" results are those that respond to the research needs more accurately and offer immediate gratification. Such interface is likely to accommodate the needs of the majority of users, although they differ in their research needs, their expectations, and their search expertise. Furthermore, users tend to apply the searching methods with which they are already familiar and are not likely to invest time in mastering a new kind of interface. In 1998, Jansen *et al.* commented that "while internet search engines are based on IR [information retrieval] principles, internet searching is very different than IR searching as traditionally practiced and researched. internet IR is a different IR, with a number of implications" (Jansen *et al.*, 1998). Today we see a complete change: users base their expectations for IR searching (that is, searching for library materials) on internet IR.

Another important aspect of the user interaction is the integration of the research process into the user's space, in both the in-library environment and the out-of-the-library environment. Whereas libraries can offer the means to integrate the process into both environments, the providers of prevalent internet tools and services may not be willing or able to integrate those products into the library environment. Library-controlled systems are more likely to be integrated with institutional portals, authentication and authorisation frameworks, finance systems, course management systems, and institutional services, whether in a single institution or a consortium. At the same time, libraries can integrate the research process with third-party tools and services, including internet tools such as del.icio.us, Connotea, and Facebook, and even expose the library data to external Web search engines, thus providing the data to users in other environments. Libraries deploying OpenURL-based linking resolvers already take advantage of such seamless integration when providing their services to their users through tools such as Google Scholar and Connotea.

Whereas internet tools and services such as Amazon.com (www.amazon.com) present recommendation systems based on accumulated user behaviour, library systems can provide more substantial recommendations by taking advantage of library-specific data such as the number of print copies owned by the institution, the circulation rate of physical items, and the number of download requests for electronic items. Library systems can also use such data to effectively improve algorithms for the relevance ranking of the search results.

The library community has accumulated a wealth of bibliographic metadata, created to describe scholarly information and provide a better means for resource discovery. Despite web search engines' lack of reliance on such data when performing searches, the data can and should serve to improve the search experience. Library-controlled systems can use structured bibliographic metadata not only for

enhancing the search process – for example, by allowing faceted browsing[1] by subject headings, but also for enriching the relevance-ranking algorithm and recommendation options. Using authority-file data, such systems can offer alternative searches when an initial search is not successful.

Finally, with their control over discovery and delivery systems, libraries can tailor the user interface to match the needs of their own users, making the research process as friendly and familiar as possible and aligning the interface more closely with other elements that brand the institution.

Industry trends

Libraries are anxiously seeking systems and tools to address the current challenges and provide a gratifying user experience that will attract users to the libraries' collections and services. Some libraries have been focusing on improving their online public access catalogue (OPAC), given the tight bond between the OPAC and integrated library systems, while others are seeking more comprehensive solutions that deal with materials beyond those in their catalogues.

Among the software developers that have addressed the changing user expectations are Ex Libris (www.exlibrisgroup.com) and Innovative Interfaces (www.iii.com), which are both vendors in the library market; Endeca (http://endeca.com) and FAST (www.fastsearch.com), which have been successful in non-library environments (for example, internet shopping malls) and are eager to apply their technology in the library domain, typically on a project-by-project basis; Medialab Solutions (www.medialab.nl/index.asp?page = about/profile), which also comes from outside the library domain but offers a product-based library solution; and OCLC (www.oclc.org), whose WorldCat® catalog (http://worldcat.org) is a global service rather than a local implementation of a product.

The version of the OCLC WorldCat global library catalogue that was launched in the summer of 2006 is an attempt to address the user-experience challenges within the well-defined boundaries of the catalogue. Although featuring new search and navigation options such as faceted browsing, the WorldCat catalog has a limited search scope, the catalogues of the member libraries. As of March 2007, OCLC did not provide local branding or services tailored to individual libraries. However, in April 2007, OCLC announced the pilot project of a new service, WorldCat Local, which will enable libraries to brand the WorldCat interface, control the display order of the results, and integrate WorldCat Local with local services such as circulation, resource sharing, and full-text linking.

AquaBrowser Library® (www.medialab.nl/) of Medialab Solutions is the most popular local solution as of this writing, installed at 200 libraries, almost all of which are public or school libraries. The largest of these libraries is Queens Library (www.queenslibrary.org/index.aspx) in the borough of Queens, New York City, which adopted AquaBrowser Library as its catalogue interface in March 2006. In addition to a simple-search feature and faceted browsing, the AquaBrowser Library interface offers a visual map, or "word cloud," related to the search terms. The word cloud presents variations in spelling, words whose meaning is similar to that of the search term, and translations of the search term. However, AquaBrowser Library does not integrate completely with the library system; for example, the product does not provide an availability statement for the records that it displays in the result list. Also, the

interface, primarily the word map, does not comply adequately with accessibility guidelines, so many users might find it challenging. In September 2006, Medialab Solutions announced a hosted version of the AquaBrowser Library product, AquaBrowser Online (www.aquabrowseronline.com), which is designed for smaller libraries and holds up to 150,000 titles.

Endeca is most notable in the library world for its project at North Carolina State University (NCSU), where the company developed a new user interface for the university's library catalogue (www.lib.ncsu.edu/catalog/). The new catalogue was released in January 2006 and was warmly received at NCSU and applauded in the industry. However, according to Calhoun's (2006) report for the Library of Congress:

> [. . .] the new NCSU catalog is limited in scope to NCSU's library collections; it has not diversified its functions to cover more of the scholarly information universe. It does not merge the ILS finding function and metasearch, nor does it support a variety of metadata types. It does not interoperate with the campus learning management system or enable users to search library data directly from external search engines or portals. This is not to be critical of NCSU's highly praiseworthy achievement, but to suggest the scope of the problems that remain to be solved.

A different, more comprehensive approach is represented by the Ex Libris Primo® discovery and delivery solution, released in early 2007. Primo enables libraries to locally create a branded and fully customised user-experience layer over their collections and integrate it into their environment, regardless of the collections' location and content.

Primo: an example of a new-generation user experience

The design of the Primo system started at the level of the user experience. User-interface architects surveyed users' needs, preferences, and behaviour patterns and based the initial design of the Primo software on the results of that investigation. This initial user-interface design was corroborated by recent library research, correspondence in online forums such as NGC4LIB (next generation catalogues for libraries) (http://dewey.library.nd.edu/mailing-lists/ngc4lib/), discussions with customers, and three usability studies (Tuval, 2006; Rosen, 2006, 2007).

Through the Primo discovery and delivery system, libraries can present their collections in a new way, which enables users to access an authoritative information landscape from a single point. This information landscape is an aggregation of both locally held collections of various types (e.g., the library catalogue, digital repositories, and course management systems) and remote resources, such as abstracting and indexing databases and e-journal collections. The system uses just-in-case processing of the data that it obtains from the various harvestable resources, and just-in-time searching in other, typically remote resources, through metasearching; that is, instead of pre-processing the data, Primo uses the Ex Libris MetaLib® metasearch engine to locate the data and process it only when the user launches a query (Sadeh, 2006). Although data elements may originate from heterogeneous repositories and be of different types and cataloguing formats, the Primo system normalises the harvested data (making the data conform to one set of rules), converts it to a unified format, and deploys other features such as deduplication and the grouping of similar items[2] to enhance the user experience. Furthermore, the system complements the harvested data with data coming from other sources, such as repositories of tables of contents and

book-cover images. The result of this process is an enhanced index that is designed to support fully the task at hand – a quick, efficient, and friendly search process.

The way in which users enter queries in the Primo system and the way in which the system analyses those queries resemble the corresponding features in web search engines. Primo provides various linguistic capabilities and, when relevant, suggests alternative terms, which are based both on general data, provided by dictionaries and thesauri, and on library-specific data, such as authority files. Furthermore, by offering relevance ranking, faceted browsing, and suggestions for new searches, the system helps users focus on the appropriate results. To complete the discovery process with delivery options, the Primo system displays an availability statement for each result along with a "get it" button that links the user to the most appropriate service for the specific context, such as a method for obtaining the actual material if it is available online or for obtaining information about the location of a physical item.

Incorporated in the Primo user experience are multiple elements adhering to Web 2.0 concepts, such as social computing features, including tags, ratings, and reviews that members of the institution's user community can share with each other or with communities in other institutions. In addition, the Primo system is integrated with other environments; for example, users can move items from their Primo space to a personal space in their Connotea account.

Conclusions

Libraries provide their collections and services to a large variety of users, some of whom will continue using the library interface regardless of the way in which it addresses their expectations. However, the majority of today's library users are those who were born into the internet age and whose scholarly research habits are tightly bound with their overall internet experience. To remain relevant and continue serving as trusted resources of knowledge, libraries need to adapt to the changing world and accommodate the current and future information needs of these users. However, accepting the "good enough" approach of popular web tools and services and giving up the quest for absolute accuracy and quality is not an easy task for librarians. Nevertheless, they need to distinguish between the manner in which they deal with their collections and the manner in which they offer the collections to their users, and to find methods of leveraging their expertise for the benefit of scholars.

The library software solutions that are now being developed focus on the discovery and delivery of relevant, top-quality resources. These solutions are designed to meet the user's expectations for a primary tool for the discovery of authoritative information. They can be integrated into the user's environment; they provide fast, simple, powerful searching; and they encourage collaboration. With such qualities, the solutions will undoubtedly be able to bridge the gap between library offerings and user expectations. It is time for libraries to work with vendors and help users focus on quality resources in a way that suits today's lifestyle. In this manner, libraries are likely to regain their role as guardians and purveyors of human knowledge.

Notes

1. Faceted browsing enables a user to narrow down search results; the system analyses the result set and groups the results according to data extracted from metadata fields such as subject, author, date range, type of material, and language.

2. The Primo groupings are based on the IFLA Functional Requirements for Bibliographic
   Records (FRBR) report (IFLA Study Group on the Functional Requirements for
   Bibliographic Records, 1998), with enhancements resulting from librarians' feedback and
   input from development partners. According to Tillett (2004), "FRBR offers us a fresh
   perspective on the structure and relationships of bibliographic and authority records, and
   also a more precise vocabulary to help future cataloging rule makers and system designers
   in meeting user needs."

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