If You Build it Will They Come?
Services Will Make the Difference in a Portal

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Keywords: services, portals, web design, functionality, customization

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Services Will Make the Difference in a Portal

Abstract: Identifying and adding services to a library portal will add to its long term success in a market that pits libraries against commercial vendors like Google and Amazon.com. The current focus on portals has been on selecting collections and developing the basic functionality of the website. We look at the added features needed in order to make this a product that is attractive to today's researcher.

Why all the interest in portals? Bluntly put, our users find our collections too confusing and intimidating and want us to do something to help them. Portals offer a way to present our highly complex collections in ways that are more easily comprehended by our users and to enhance the use of our collections by offering a variety of services to complement our collections.

What do Yahoo, your local bank and SilverPlatter have in common? They offer personalized services to users. It is no longer enough to have a product; today users want personalized service. Libraries are not immune from this expectation. Librarians long have been aware of the complexity of our collections and have developed various approaches to handling that. We have reminded users that we are here to help them find and interpret material. We have created subsets of our libraries that seem more manageable to the user, such as separate science libraries or undergraduate libraries or focused collections like browsing collections of contemporary fiction. We have opened storefront libraries to deliver collections where people go.

After centuries of building collections of research material and making them available to our users, ironically, recent research suggests that user reluctance may be, in fact, due to too much choice. Schwartz reported research showing that as the number of possibilities increased, satisfaction went down. He continued, "Similarly, an abundance of options raises people's expectations about how good the option they have chosen will be" (Schwartz, 2004). Users of libraries today find the number of databases overwhelming, the search interfaces complicated, and the service options confusing. They want to be able to ask a question in a single interface and see the results, they want to arrange for document delivery of articles and ask questions of experts in the field when necessary. Many academic libraries have responded by developing scholar's portals.

What is a portal? Marketingterms.com defines it as "a site featuring a suite of commonly used services, serving as a starting point and frequent gateway to the Web (Web portal) or a niche topic (vertical portal)." The new Oxford English Dictionary includes a definition in this sense, as "…Originally: a server or web site that provides Internet access. Later also: a web site or service that provides access to a number of sources of information and facilities, such as a directory of links to other web sites, search engines, e-mail, online shopping, etc." (Oxford English Dictionary, 1989).

Typically, the difference between a web site and a portal is that, while both offer a set of web pages and links, a portal additionally can be personalized and customized, it is role based (the resources and services presented to you depend on your "role," as a student, a faculty member, a community user), and it provides for user authentication.

The strength of the portal lies in its ability to offer added services to patrons. Libraries historically have looked for ways to make collections more accessible. We have been early adopters of technology, computerizing catalogs and databases, and creating—from the beginning—highly structured MARC records that have been adaptable in multiple ways. More recently, we have invested in the development and use of online chat software, and have implemented federated search engines and portals to try to make users' research lives even easier. Interfaces have long allowed cross-database searches within a single vendor's software; new federated search engines provide the ability to search across databases and indexes from multiple vendors and multiple interfaces. Portals take these technological advances a step further by including not only a wide range of search options, but also the ability to personalize, to customize, and to authenticate.

As librarians evaluate what services to offer within the portal environment, a look at two typical yet disparate users helps to highlight the features and functionality users might find most appealing

Who are our users?

In 2002, the Pew Internet & American Life project released a study titled *The Internet Goes to College*. The study examined the impact of the Internet on the daily lives of college students. Not surprisingly, college students use the Internet heavily as part of their daily routine. Students rely on the Internet to communicate with each other and they turn to it regularly when assigned research for their classes. Approximately 73% of the students surveyed said that they use the Internet more than they do the library; and 68% subscribe to academic discussion lists related to their classes or

majors (Jones, 2002). With this data as a background let us look at two students currently enrolled in college.

George, an undergraduate, needs to use a variety of resources to complete his twenty-page term paper in history. George is typical of many students: his paper is due soon; he is unfamiliar with library research, and he wants, quickly, to get full-text articles, not just citations. George has never taken a library orientation class, so he finds it frustrating to do research in his academic library. He doesn't even think about asking one of the librarians at the reference desk for help; in fact he does much of his research at one of the many computer labs on campus. He is confused by the number of databases and does not know how to select the right database or how to prepare a search statement appropriate to the interface presented. He is not sure how to get the actual articles, and he has to prepare a bibliography of sources used.

It is not atypical for students to consult several databases in their search for the right article(s). Depending on how the library's indexes are arranged, George may be able to find a history database, but once he is connected he may not be able to figure out how to construct a search statement to find what he needs and if the database does not supply full-text, then George will hunt around until he finds a database, any database, that has full-text available. When the full text is not available in the database, he needs to know that he has to search his library catalog or electronic journal list to find out if the journal is available in the library or, even better, online. If he is not easily able to find articles that will help him with his paper, he likely will turn to a website that has served him well in the past, Google. With the entry of a simple search statement, and no need to worry about Boolean operators, George will have at his fingertips

hundreds if not thousands of "hits" directing him to information on his topic. Is it good information? Is it scholarly? George does not care. He got the results he wanted in a matter of minutes, instead of spending hours to learn how to do research at the library.

Our second "scholar" is a graduate student, working on her dissertation in anthropology. Sarah is a skilled library user and is away from her home institution doing fieldwork. She is familiar with the resources available to her at her home institution and if she is lucky, she knows how to enable off campus access and can get to her home library's databases from her computer. Sarah may have some privileges at a nearby university, but they may not include off campus access. The library she's visiting may not subscribe to the resources she needs and they may not allow her to use Interlibrary Loans. Sarah needs easy access to library materials and, ideally, wants them delivered to her desktop. In addition, she would like access to bibliographic management software to manage the many citations she has amassed for her research.

The difference between these two users is the degree of familiarity they bring to the overall library research process. George as a novice needs a website that does not overwhelm him with the number of choices available on a chosen topic. Instead it allows him to enter his search statement and retrieve results containing both full text and citations. He should be given the option of getting additional assistance and more databases if he so desires. Sarah as an experienced researcher, needs easy access to library tools off campus and additional resources that allow her to manipulate, deliver or save the results of her long-term research. Both Sarah and George would benefit from a portal and the services it provides.

Before we look further into the world of portals, let us take a look at telephones

and the Internet and how they have developed in the last 100 years. Why? Because their development in many ways reflects the journey we are currently undertaking in the development of federated search engines and portals.

A Historical Perspective

Alexander Graham Bell invented the telephone in 1876. It took a hundred years to get to today's environment where we have confidence that when we pick up the receiver, we will have a dial tone, it will be stable, and we will be able to use the system to call anywhere in the world we choose.

ARPANET linked four sites in 1969 (UCLA, Stanford Research Institute (SRI), UC Santa Barbara and the University of Utah). In 34 years, a third of the time it took for the phone system to mature, we have seen growth from 4 connections to 19.5 million. Technology is continuing to grow, develop, and move, sometimes slowly, sometimes fast, toward stability. We were happy in 1876 just to make the connection, while today's phone users expect services ranging from answering machines to Caller ID to cell phones to complete mobility and ubiquity.

In parallel, computer users once were happy with 300 baud dial up connections; we now demand 'always on' internet connections, delivering content plus a growing array of services. We shop, we communicate, we play games, and we sometimes even do work. Our students have grown up using computers and expect quick connections, rich content, and a variety of services. How do libraries provide that?

Librarians are hampered by the costs of developing online versions of traditional services. It is hard to compete with the rich features of, say, an Amazon.com, when we

lack the millions of dollars that such commercial sites spend on programming and development. On the other hand, a 2003 report from OCLC, "Libraries: How they stack up," points out that U.S. public library cardholders outnumber Amazon customers by almost 5 to 1 and each day, U.S. libraries circulate nearly 4 times more items than Amazon handles (OCLC, 2003). We can be optimistic that when a hundred years have passed in the computing development timeline, we will have fixed the software, resolved the technical issues, and created the services as did telephony in its comparable century.

What libraries have to their benefit, however, is a long history of cooperation. We form coalitions, consortia, partnerships and project groups and work together to develop strategies and services that benefit us collectively.

Ironically, recent research suggests that our problem may be "too much choice." Barry Schwartz presents research evidence to suggest that "for many people, increased choice can lead to a decrease in satisfaction. Too many options can result in paralysis, not liberation" (Schwartz, 2004). The single-entry Google search box becomes attractive, then, in part because it reduces the choices a person must make among dozens of databases and web pages. Libraries actually have attempted to deal with this problem. Whether we have articulated it in the same way as Schwartz and his fellow researchers, we have been aware, especially in large academic libraries, that our collections can be intimidating. We have addressed this by creating smaller subject-based libraries (the science library, the documents library, the undergraduate library) or focused collections (the browsing collection of contemporary fiction).

What can libraries do?

In the last several years, librarians have begun to talk about "portals" or, more accurately, federated search engines, usually understood as systems which allow a single search executed across a number of databases or indexes. While federated search engines allow searching across disparate databases, portals imply an additional layer that adds personalization, customization, and authentication. Portals offer users a level of service they are used to seeing in the commercial sites they visit regularly on the Internet.

Academic librarians face challenging questions. Do we integrate software and services at the campus level? Should the campus portal—a role-based, personalizable, customizable, authenticated portable desktop—be the main point of contact through which we provide library services in addition to campus services? Or should the library itself provide such an access point?

The current array of services offered divides the tools users need into subject (or other) categories, but for the most part they will need to search each one individually. The portal makes the same information available, but rather than repeating a search several times, users select the databases and enter searches one time. In addition to the single search across multiple databases, federated search systems typically offer de-duplication of results, links to full text, and the ability to create a customized list of databases to be searched that match the researcher's needs.

The Next Step: Services

Other sources have described the ideal federated search system. It can connect to all library electronic resources, offer high-level search functionality (Boolean

searches, de-duplication of results) and connections to full text sources. This article focuses on the services in either a portal or a federated search engine that ought to be available.

As Jakob Neilsen has pointed out, portals ought to know a lot about their users without the users having to describe themselves. He was talking about corporate intranets, but in a college setting, we also know a lot about our users. Before users begin any kind of personalization, especially in portals integrated at the campus level, those who create and manage portals can determine the status or role of the person (student, faculty), know what courses they are taking or teaching, what reserve readings are available to them, and what subject areas they are interested in—all based on their public identities (Neilsen, 2003). We can start to create services that are tailored to the users, available at point of need, and offer genuine assistance in navigating through multiple sources.

It is easy to see how helpful Amazon.com-type services might be in a library setting. In some cases, they are services we already offer, but libraries tend to present them in "library-ese." Patrons don't grasp the library terminology as readily. "Look for similar books by subject" makes sense. Clicking on the subject heading link in the catalog accomplishes the same thing, but is not always intuitive. Libraries need to be more sensitive to marketing services in language that resonates with users, so that they are clear about what service they can expect when they click.

Adapting Amazon-like functions to library operations

Looking at Amazon.com's services suggests ways existing library services could be

made more intuitive and friendly. As mentioned in the previous paragraph, libraries offer many of these services, it is just not apparent to the user. We are not advocating that we turn completely away from traditional library services, but that we consider ways to attract users back to libraries again and again. Nor is it necessary to implement a portal in order to think about new ways of presenting services to users. Amazon's structure is relevant in part because libraries and it both deal with, as Ranganathan once said, matching every reader to his or her book.

Below are some ideas which take Amazon.com's current list of services and suggest ways those services can be adapted to the library environment.

Recently Viewed Items: helpful to people doing extensive research in catalogs, indexes, or databases as a tracking device

The Page You Made: An online "data locker" where people can keep notes, citations, favorite URLs, downloaded copies of articles and more

See What's New for You: New books, journals, articles, alerting service requests

Where's My Stuff? Items checked out, my recalls, the ILL articles I've just received electronically

E-mail notifications: Books are available to pick up, a class is being held on a database of interest, the subject librarian is teaching a short class on a database today

Recommendations: Subject librarians could create recommendations of new books, journals, important articles, new services.

Personal Information: A place to record or change e-mail and regular mail addresses, passwords, subject areas of interest, etc.

Customers who bought this also bought: "People who checked this out also checked out…"

Product Details: Help files, of course. Title lists and content descriptions.

Our Customers' Advice: In Amazon, what customers recommend in addition to the item selected; in a library context, parallels the recommendations section—librarians make the recommendations, users provide the advice to their fellow readers

Listmania! User-contributed best books/best resources lists both for scholarly study and for recreational reading

Look for similar books by subject: Enhanced subject heading links

Editorial Reviews: Direct links to online review content from other sources.

Customer Reviews: As in Amazon's site, links to comments by readers on library resources, providing a level of user feedback we may not have seen before

Without advocating that we re-make our portals in Amazon's image, studying the services provided and adapting them to libraries, as appropriate, is a way to repackage or reshape activities libraries long have performed. People return to Amazon time and time again. What is it that people find so attractive? Is it the price? Reviews? Lists? What can librarians learn from Amazon.com and similar commercial sites that could apply to the development of portals?

We also—and this is not an effort unique to portals—must identify and remove barriers to user success (Souza, 2001). More and more libraries are actively seeking user feedback, asking them for ideas on how the library can better meet their needs. The most progressive organizations are willing to rethink administrative and

technological operations that have become barriers to library use.

Searching

One of the strengths of the portal is the simplicity of its interface. Ideally, patrons can use one search interface to search multiple sources at one time. However, this can also be one of its "weaknesses" if good interface design practices are not followed. For the portal to be successful, it has to be very easy for patrons to identify the types of databases they need to search for their topic. Subject groupings should be kept to a minimum and the databases in each carefully chosen. The criteria for inclusion will vary, but patrons want to know at least two things about each database beyond the topic it covers: Is it full text? Is it popular or scholarly? The groups also should be arranged so that patrons can pick out the type of material being searched: digitized collections, images, books, reference tools, articles, and so on.

Users should be able to personalize the portal. Without this capability, users will see no difference between it and other databases that libraries now subscribe to. They may find it even less useful if they cannot combine databases and other tools in order to do their research. Similar to the "My Library" concept, users should be able to either personalize a pre-existing subject group, adding and deleting databases or websites to better suit their needs or build a subject set from scratch, selecting their resources from a list of available databases and building a "favorites" list of websites.

A further search tool beneficial to patrons is a "411" (or information) search, named after the telephone company's directory information service number. This type of search was and is one of the strengths of the Dialog search system, whose file number

for this service (DIALINDEX®) is indeed 411. Users can see possible databases for a topic and see the number of retrievals available from the databases chosen. This allows users focus their efforts on the databases with the higher number of "hits." While this is not foolproof, it does allow the patron to quickly eliminate databases that are not promising. Anything that can be done to allow the patron to move quickly and efficiently through the search process will keep them coming back again and again.

Natural language searching, while not perfect, is a style that patrons frequently request and automatically do when searching a database. Undergraduates type in a topic sentence without much thought. They are frustrated when expected results don't materialize and don't know how to construct a search statement that will produce the desired results. They often do not understand Boolean searching. Still, while natural language searching may return fewer results, much of the time it satisfies users' needs. Making natural language searching the "basic" default in the portal will give students results that most of the time will satisfy their research needs. Including a link or icon giving them the option of a more advanced search should be available to those who need the power of the Boolean operators. Many databases include basic and advanced search engines, and making the natural language search the basic option would help the novice researchers get started and not overwhelm them with too many search rules that can be frustrating and cause them to turn to Google where they "know" they can get results.

Once the results have been returned, they need to be processed to remove duplicates and sort as desired. Relevancy ranking is the most useful of the sorting options and should be a staple of a portal from the very beginning. Searching multiple

databases retrieves large result sets; often the results are returned based on the fastest response time. For the patron to find results useful, automatic relevancy ranking is necessary. This may slow response time, but will make the system more useful to the researcher. Standard sorting options should also be available, including the ability to sort by document type (article, website, book, dissertation, etc.) year of publication, and location (identifying those locally available versus those which must be obtained via ILL.). Patrons will return to a service that gives them targeted results and in addition allow them to identify those items that are readily available. While there will be times that a patron will want the item only available via ILL, providing the link to make the request automatic will increase the likelihood that they will actually use the power of ILL.

Searching multiple databases can also be a weakness in a portal. While you gain in the ability to search across databases, you may lose some functionality available in the database's own search engine. One solution is to provide a link to the database that transfers the search statements to the native interface for the user who wants to delve deeper into his or her topic using just one database. This bridge would allow users the benefit of seeing what is in multiple databases, allowing them to take advantage of each database's search engine when necessary, without having to remember and retype their searches.

Microsoft has made office assistant icons available to those customers who want a personalized guide to assist them in using its products. Designing an online advisor to help users focus their research questions and suggest resources would assist them in confronting the overwhelming number of tools. Allowing users to select their online

advisors will further personalize the service and if the "advisor" had access to user information, it could be very effective in guiding the user through the necessary steps in developing a good search strategy. Useful information might include: syllabus, reserve readings, lists and subject databases selected by the professor for a class. This advisor could conduct "reference interviews" to help users isolate their questions and make suggestions regarding the direction of their research as well as possibly suggest search statements as a starting point.

Finally, patrons will want a variety of output options beyond the standard e-mail, download or print. More and more citation tools are available via the web and researchers will want to be able to transfer and save results to their preferred software files. In addition, saving search statements to run at a later date (or better yet, automatically) will be a service desired by the more sophisticated scholar.

Document Delivery Options

Adding services to a federated search engine elevates it from a mere search tool to one which is a true research assistant. Alert services already exist within vendors' sites and within specific databases, but the ability of a robot or search assistant to manage a fine-tuned alerting service across multiple databases is needed. Enhancements to traditional e-mail delivery must include delivery to cell phones or PDAs. Patrons will want to set alerts for topics, or for items published in specific journals. Subject specialists will be able to craft subject-oriented alerts, to notify patrons of new materials (items received in the library, selected websites, and perhaps even notifications of upcoming speakers or conferences). Users can subscribe to such

services and have information pushed to them, again either via e-mail, cell phone, or PDA. It would be helpful (and really cool) if, as you walked into the library with your wireless device, the system would "know" you were there and alert you to items on the new book shelf, talks being given that day, or new issues of journals.

Users will want to know how to get items delivered. Does the library subscribe to the item in an online form? Then a link must be provided to connect to the full text. Is the item in print? Then call numbers or locations and interactive maps to guide the user to the shelf should come into play. Such tools must be integrated into other library systems as well, to determine whether an item is truly on the shelf, is checked out, is in a processing area, in a consortium partner library, or in a local or regional storage facility.

Assistance

The portal is designed to bring collections together making them easily accessible. However, patrons will still need assistance and it can be assumed that many will not actually be in the library near a reference desk at their time of need. A robust array of online assistance options will be needed and these services need to go beyond the basics of what is currently available. Tutorials, help screens, mouse-overs, e-mail assistance, and 800 numbers are most commonly found today. While these will be available on the portal, user assistance needs to go farther. Portals should provide a menu of point-of-use tools that work with the user's preferred mode of learning. (Note: Some of the tools listed are not "aids" in the truest sense, but instead focus on the different ways users can communicate with librarians, scholars, students or instructors)

Chatrooms, blogs, and bulletin boards are some of the online tools being used more frequently by faculty to allow students a space to ask questions outside of class and carry on discussions with their classmates. Portals can provide space in various subject areas for users to ask questions and talk with scholars about topics in a particular field. Systems should provide a way to examine user behavior while stripping out identifying user data so that librarians and others could monitor these tools to look for areas that are particularly troubling users and use the information to improve the product. Librarians could also hold subject oriented "office hours" to answer questions and assist users with their research. A "hot topics" area would be useful for undergraduates who need to identify current or controversial topics for their papers. This area could include a list of topics, search statement possibilities, opposing viewpoints, print and electronic resources providing popular and scholarly information. Building a favorites list based on professor or librarian suggestions and ideas from fellow students could also be included in this area.

Another tool that could be included is a writing toolkit. It could include links to bibliographic management tools, style guides, and sites on plagiarism. A link to the school's writing center would promote the importance of research to writing and could highlight the interconnection between research and writing and the importance of clear communication in research papers.

Accessibility

Early computerized databases were little more than print indexes transferred to computer and mostly searchable, albeit more quickly, in the same author/title/subject

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manners as the paper indexes. Each generation of computing adoption, certainly in libraries, has seen the following repeating sequence. First, the tool or service itself is exactly reproduced on a computer. In the second phase, more functionality is added, though the structure of the original is retained. Now, abstracts and in some cases even full text are searchable but the structure still is more or less that of a traditional index. In later phases we finally see a movement away from traditional structures and a willingness to look at new ways of searching and presenting information. We saw this pattern played out in library web pages; early pages had limited information and mirrored libraries' organizational structures. For example, in order for users to find out online whether they had books checked out, they had to know that book check out was a function of the circulation department and first go to the circulation department's web page. Only in later iterations did libraries finally learn to create pages to provide access to information and services that did not require the user to understand the structure of the library in order to find what they needed.

We need to keep this development pattern in mind as we work with portals, especially when a decision needs to be made about creating a library portal versus integrating library content and services into a campus portal. Do we still require our users to understand the structure of the university in order to find information? Why not create a library channel on a university portal to smoothly provide content and services to students, faculty, and staff? Why create multiple portals requiring multiple authentications? At the very least, library staff should work closely with campus developers as these decisions are being made. There may be reasons why a separate library portal is desirable (which may be contractual or technical) but the decisions

should be carefully evaluated by both library and campus portal builders. The best choices will be informed by values that insist on the delivery of clear, understandable content and services, ideally not determined by politics or territoriality.

Administrative Tools

Any kind of portal, whether at the campus-level or at the library, must have a variety of administrative tools to help manage content and delivery of services. Among useful ideas are dynamically-generated web pages, web interfaces for adding and removing resources, an easy way to manage user accounts and authentication, and clear tools and rules for maintaining data on individual users in the light of growing privacy and confidentiality concerns. Feedback mechanisms are not just necessary, but vital to the success of the portal. Knowing what our users like and dislike about the portal concept will help us to evolve and respond quickly to the changing technological landscape. User focus groups and other usability testing processes are essential to ensuring that the final product is useful to various constituencies.

Conclusion: George and Sarah

Let us return to our two scholars mentioned at the beginning of this article. How would they approach their research assignments if they had access to a portal?

George, our intrepid undergraduate student, logs in to his personal university account and on the first page he sees an icon directing him to a link for history research. This link is personalized for his class and is targeted to an undergraduate researcher. As he enters this portal, he is offered the option to either look at a select list of databases to start his research or to click on the online assistant to help him focus his

research topic and identify the right database(s) for his research question. George notes that the history librarian and his professor will be online in an hour if he has questions about his research project. George also sees that there is a list of websites that students who have taken this class last semester recommend to help him get started with his assignment. George does some preliminary research and is pleased to discover that he can save his search statements and results so he can come back to this later when he has time to do more work on his paper. He also notes the library hours, in case he decides later to look at some reference books, or to speak directly to a reference librarian about his paper when he picks up the books being held for him at the circulation desk.

Sarah, in the portal environment, has authenticated as a university graduate student. Within her university's portal software, her role as a graduate student means she has access to resources and tools from locations outside the library and campus. Even from her remote research location, she can connect to the electronic resources she is accustomed to consulting. She has remote access to a web-based bibliographic citation manager, so she can document the material she is consulting at her remote research site, whether she has viewed it via her authenticated connection or whether she identifies it at the local library. Even though she is away from her campus, she can connect to her online class website and participate in a discussion among the students. In the course of her research, she has a question about the mechanics of a particular database, so she connects to her library's chat reference service and consults the librarian for clarification. She can even store copies of articles in her digital storage locker and work with them later when she returns home.

Campus funding is often dependent on our ability to demonstrate our centrality to the teaching, research, and service missions of our universities. Students vote with their feet and satisfied student users will continue to use our resources and services, turning to us first, before they try general web surfing or giant web search engines.

Portals tie together access to online and print collections, functionality, and services, to provide users with a single point of access to a variety of resources. Portals can be integrated with school or campus portals, or can operate as independent library ones. In any scenario, their easy access to online materials and functions will draw users initially, but services will keep them coming back.

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