
PORTAL APPROACH TO LIBRARY WEBSITES : LIBRARIES NEED TO DISCOVER NEW INTEGRATED PLATFORMS

I V Malhan

Shivarama Rao

Abstract

The advent of the World Wide Web and digitisation of publications have resulted in the proliferation of a vast amount and format of content types. Initiatives such as cyber infrastructure recommended by the NSF foundation provide specifications for accessing data, information support the emerging collaborative processes within sciences and includes several components relevant for libraries. Libraries are rapidly changing and expanding to web-based delivery of content and related access services in order to conform to the changing information seeking methods and expectations of their users. Developing an understanding of changing user demands and the basic building blocks of a new architecture will be a challenge in our current library environment. Presently our current technical systems are organized around data (e.g. the catalogue, vendor-based indexes and publishers) or services (e. g. interlibrary-loan, circulation and reference). One approach is to design multi-tired architectures that include an integration layer providing programme level services for user level applications such as a portal. Web portals are seen as positive potential frameworks for achieving order out of chaos. The library portal is one approach to organize information resources and services in a way that supports the users' needs. However, the library portal will not be the only starting point for access to the library. The future of library websites in fact lies in integration of different effective information management and need based service modules.

Keywords : Library Websites, Library Portals, Library Automation, Portal Approach, Integration

1. Introduction

Portals are transformational tools that address the problem of information glut by customizing information content to meet specific end-user needs. The Web environment is growing in its importance as the preferred way of organizing and using information and for organizing work environments. Rapid advances in information technology point to the Web as the main framework for organizing information for work, research and e-commerce. The Web is rapidly becoming the preferred venue for information, financial transactions, document management and more. With the development of the World Wide Web, the "information search" has grown to be a significant business sector of a global, competitive and commercial market. Powerful players have entered this market, such as commercial internet search engines, information portals, multinational publishers and online content integrators. Will Google, Yahoo or Microsoft be the only portals to global knowledge in 2010? If libraries do not want to become marginalized in a key area of their traditional services, they need to acknowledge the challenges that come with the globalization of scholarly information, the existence and further growth of the academic internet [1]

Web portals are seen as positive potential frameworks for achieving order out of chaos. As portals become a primary means for transacting information and commerce, libraries of all types are becoming involved in thinking, planning and building various frameworks and services that they call *portals*. For many library customers, if what they need is not on the Web, it does not exist. Increasingly, information is

available from alternative Web sources, and libraries have to compete with a diversity of new information services. If information is difficult to find using library tools and services, customers are looking for alternative sources – if they even think of libraries at all. This new reality translates into the need for making library Web environments effective and useful. This trend is especially challenging for libraries, who were and continue to see themselves as the traditional keepers of knowledge, which until very recently was housed in many millions of books and journals that are rapidly becoming digitized. We see a growing acceptance in libraries of Web portals as a framework for work and for Web services, as a way of increasing access to collections, learning and work [2].

The future of library websites lies in integration of different information management and services modules. Maintaining standalone modules with loosely integrated or moderately interoperable functions is too expensive for libraries. This is why libraries sought integrated systems in the first place. XML, web services, OpenURL, OAI-PMH, and the rapid development and approval of new standards are the true hope for the libraries. Perhaps we'll come to call them interoperable library systems, or even integrated library services.

Today managing library automation is now far more complex than the traditional maintenance of an integrated system. For instance, considering a standalone product, librarians should ask themselves and their vendors how this new product fits with existing efforts toward functional integration. Does the electronic resources management system know about the print journals? If considering a database portal, determine if it will use catalogued electronic resources. For digital access management systems, what can they accomplish that the cataloguing module cannot? If assessing a metasearch tool, find out if it can leverage the valuable features available from the various database providers.

The digitization of publishing and the advent of the World Wide Web have resulted in the proliferation of a vast amount of content types and formats that include, but are not limited to, digitized collections, faculty and research groups' websites, conference web servers, preprint/e-print servers and, increasingly, institutional repositories and archives, as well as a wide range of learning objects and courses. If these resources are registered by a library at all, then they are in the form of separate lists of links or databases, but are not integrated into local digital library portals.

How should libraries see the future of their information discovery services? Instead of a highly fragmented landscape that forces users to visit multiple, distributed servers, libraries will provide a search index, which forms a virtual resource of unprecedented comprehensiveness to any type and format of academically relevant content. Libraries liaising with other partners are contributing ultimately to an open, federated search index network that will offer an alternative to the monolithic structures of current commercial information.com indexes [3].

2. Portals and Subject Gateways

A general definition of a portal is “a Web site or service that offers a broad array of resources and services, such as e-mail, forums, search engines, and on-line shopping malls” (Webopedia) [4]. A variant is the vertical portal, or vortal, that typically provides news, research and statistics, discussions, newsletters, online tools, and many other services relating to a specific industry. This is nearer to the role in the development of the Resource Discovery Network (RDN is the UK's free national gateway to Internet resources for the learning, teaching and research community. The service currently links to more than 100,000 resources via a series of subject-based information gateways (or hubs). The RDN is primarily aimed at Internet users in UK further and higher education but is freely available to all) where a portal means a subject gateway that incorporates information from commercial sources, academic publishers and specialised databases, as well as current news and research. There is a consistency of approach

that extends across different classes and formats, to include multimedia materials, directories, web pages, full-text databases, metadata and bibliographic records. Cross-searching across these resources is fundamental. There are various collections available of links to Internet resources - or more likely just to web sites - from the broad-based consumer-orientated services like Yahoo to those that deal with a particular subject, such as EEVL (EEVL is the Internet Guide to Engineering, Mathematics and Computing). They may be known as directories or gateways and the term 'subject gateway' is common in the UK education area for those that are centrally funded like SOSIG (Social Science Information Gateway) or BIOME (BIOME is a collection of gateways which provide access to evaluated, quality Internet resources in the health and life sciences, aimed at students, researchers, academics and practitioners) that arose from the JISC eLib Programme and deal with a particular area. More importantly, these UK examples evaluate and guarantee the academic quality of sites in order to exclude sources of questionable reliability [5].

3. Need for the Portal approach to Library Websites

Libraries are rapidly expanding the Web-based delivery of content and related access services in order to meet the changing needs and expectations of their users. In the short 10-year period that the Web has existed, libraries have made great advances in their ability to provide Web-based access to a wide variety of information access services that were formerly only available within the walls of the library. Regardless of these advances, many library websites continue to replicate the physical and functional organization of the traditional library. Web-based access to services has evolved as a thin layer over library technical infrastructures that were designed to support traditional library services. As such, library websites are typically organized around library functions (interlibrary loan, circulation, reference) or existing information stores (the card catalogue, print indexes). Web-savvy users who are not familiar with traditional library organization methods do not view our websites as transparent or able to meet their information-seeking requirements. The common task of finding an article provides a useful example of the special knowledge of library organization and practices that is required to navigate a library website. The process begins with selecting a resource to search. Many users are overwhelmed when faced with deciding which information resource will best suit their current needs and may select a resource for less than optimal reasons. Once an information resource is selected, the user must often master another complex interface to search for appropriate material. Upon identification of an item of interest the user must determine if it is owned or licensed by the library, possibly remember that interlibrary loan is available and in the worst case report an item as missing from the shelf [6].

Developing an understanding of changing user demands and the basic building blocks of a new architecture will be a challenge in our current technical environment where systems are organized around data (e.g., the catalogue, vendor-based indexes and publishers) or services (e.g., interlibrary loan, circulation and reference). One approach is to design multi-tiered architectures that include an integration layer providing programming-level services for user-level applications such as a portal.

The National Science Foundation has identified and recommended a cyberinfrastructure that will be necessary to suit the needs of scientists in the future. The cyberinfrastructure specifies a service layer that includes several components relevant for libraries that support scientific research and education. They are calling for the specification of services that will provide access to data, information and knowledge management services. In addition, they are requesting the specification of collaboration services that will support the emerging collaborative processes necessary within the sciences [7].

While undoubtedly successful in offering integrated access points, from the library point of view one gets the impression that there is still some development to be done in order to build real end-user services that find the full acceptance of researchers and students. In the era of popular Internet full text search

indexes these projects are focussing mainly on metadata by giving reference information about the resource (e.g. a certain server or database) rather than searching within the content sources (such as the full text itself). The records of all these portal databases, which usually describe intellectually selected content sources, can of course be used as a valuable starting point. To support the changing user demands within the Web-based service paradigm, technical infrastructures must be made available to users in a manner that supports their tasks. The library portal is one approach to organizing information resources and services in a way that supports the users' needs. However, the library portal will not be the only starting point for access to the library. Other systems, such as course management systems and enterprise portals, may also serve as primary access points for users engaged in a variety of different information gathering tasks. The library portal, along with other application-level interfaces that provide consolidated access to multiple underlying systems, must have integrated connections to every system and information resource.

The importance of subject gateways - and portals as they develop - to the hybrid library will be readily apparent from the underlying commitment to collation of quality assured web resources. In their relatively short existence the gateways have done much to raise the profile of the importance of quality assurance with respect to web resources in higher education, as well as fulfilling their fundamental role of easily accessible navigational aids to such resources, arranged by subject.

Successful library systems will need to be designed as a set of core functional components that can be repurposed to suit the requirements of all user-level service needs and made available to a variety of application-level interfaces. Hence a library portal is defined as a web-based tool that provides a customizable interface to information aggregated from a variety of sources of a particular library with parent organization's mission and goals. Portals are implemented as application-level interfaces and based on software suites that provide integrated access to information resources and related services. Library websites integrate predominantly online library catalogues and databases with some full text repositories (e.g. e-journals). Freely available academic online content as described above is usually not covered by library portals. If they are selected at all they are mainly organized as html-link lists or specific databases that record reference metadata about web repositories.

Beyond online catalogues, databases and e-journals, researchers started to place their pre-prints or post-prints on the websites of faculties and research groups. Comprehensive web servers of scientific congresses include online presentations and papers, large international pre-print servers, often organized by the scientific community, store thousands and hundreds of thousands of documents, and the creation of e-learning objects is gaining increasing popularity [8].

4. Integration of Components : Current Trends

The broader information landscape - including library resources among weblogs, pre-print archives, and decentralised information resources and repositories mingling with enormous desktop computing power and storage on private devices - is where users and groups find, collect, and use information today. Librarians need to bring better navigational clarity and the ability to customise connections to this more diverse and decentralised information landscape.

Integration of Discussion Groups: Instant Messaging (IM), RSS (Rich Site Summary), Newsfeeds, Weblogs, Wikis and Mobile Devices for user communities is a new trend of value addition library portals. While implementing these components in the library portal one should have following questions in their mind; What uses of technology do you envisage within your institution? How do you intend evaluating the technology? What are the key needs? What are the 'softer' issues which you will need to address before deploying the technology in a service environment ?

Weblogs are 'An online journal or commentary usually written by an individual or a small group of people', and are: 'space where individual writers can easily publish texts that are easily accessed by interested readers'. This is true micro-publishing; a system where individuals and groups can reach out to influence, inform, debate, campaign or just stay in touch. Essentially Blogs are easy to use, requiring no knowledge of HTML or configuration of systems. Commonly they offer searching, indexing, categorization tools, and trackback/shareback mechanisms, whereby content on a given topic can be aggregated and tracked.

Some possible uses of Blogs in an academic environment are: Personal knowledge management, Class/cohort Web site (announcements, schedules, readings etc), Posting student work for viewing/comment by peers, Personal journal with viewing/comment by teacher/tutor, Publication of tutor essays, links or commentary to seed discussion, Community forum, e.g. Crooked Timber, 'Citizen' reporting and ePortfolio.

A Wiki was seen as a 'read/write' Web page. One use identified would be in the development of system administration documentation. The capability of a Wiki to be made both searchable and indexed makes this an ideal Wiki application. Some people see content in Wikis as being tied up and inaccessible in a way that information in Blogs is not. As with Blogs, making a Wiki available to staff and students within an academic institution means thinking about and implementing an acceptable use policy and also working out mechanisms for exporting and maybe archiving the contents. Uses for a Wiki could include: Virtual group study rooms, Timetabling and course administration, Shared resources for research groups and User support and documentation.

The online library software somehow had to catalogue, or at least provides a gateway to, a huge variety of materials in the hands of many different proprietors. Integrated library systems have met this challenge by converting the simple OPAC into a comprehensive, customer-driven library portal.

Here, in a nutshell, is what makes a library portal different from the OPAC of old [9]:

Federated search: A well-stocked library may subscribe to hundreds of online databases and other resources on behalf of its patrons, each with its own search interface and login procedure. A federated search lets the user enter the search criteria once and eliminates duplication among the results.

User profiles and contexts: The system knows who the user is and what the user generally wants, and uses that information to tailor its services, integrating with the campus's administrative information and course management systems. e. g.: My Yahoo.

Multiple channels of content: The system can offer weather reports, RSS feeds, and the dining hall menu, in addition to more formal library databases and collections.

Customizable content and interface: The library can customize the portal by branding it with its own look and feel. Users can choose interface design and needed tools, by default. Some library portals even offer the flexibility of "skins": easily interchangeable surface designs such as those featured by MP3 software.

For example Lehigh University is creating context for its library users with the help of an open source library portal called MyLibrary that is being developed at University of Notre Dame under the leadership of Eric Lease Morgan, head of Digital Access and Information Architecture. At Lehigh, MyLibrary collects information about each user (such as a major declared in the university's administrative information system), and uses it to build a customized collection of relevant reference resources, which the user can then customize to taste. MyLibrary also interacts with the campus's integrated library system to automatically retrieve references to journals and databases in the user's field of interest.

Does a comprehensive library portal run the danger of overlapping and competing with efforts to develop an effective institutional portal? Doug Randall, technology product manager at Innovative Interfaces Inc. (the developers of the Millennium ILS; <http://www.iii.com/>), sees the two kinds of efforts eventually converging. "Institutional portals can seem sometimes to subsume the library, by implementing some of the federated searching and meta-searching that the library may already be offering to its users. Where you draw the line is not clear. But the future is probably integration rather than fundamental migration of the functionality totally in one direction or the other." But what about the future of the portal concept itself? The primary concept that makes the portal possible is that information services can be constructed in a way that makes them independent from a specific appearance they must have on screen. There are many names and styles for this abstraction: Web Services/XML, OpenURL, APIs, widgets, and RSS feeds. These "browserless" services provide information when a program asks for it; a user doesn't need to point and click. The information is returned in a structured form that can be easily processed by the local program that called for it. Once services like specialized search engines are provided this way, the portal can freely combine and repackage them. Hence the user can begin to choose from many interfaces to reach these abstracted services. The interface then becomes a commodity, not a monopoly [10].

These are new sets of networked tools supporting information management for individuals and for distributed groups, i.e. a new class of service which is implemented in few reputed institutions in western countries. Daniel Chudnov et al. (2004) describe a potential groupware framework for integrating access to diverse information resources and distributed personal collection development. The following paragraphs are explained based on his case [11].

It is interesting to examine the relationships between the above mentioned tools and what they help users to do. The following three networked applications are used constantly viz. link resolvers (which short-cut access from one Web resource to related resources or library services); bibliographic reference managers and weblogs. In a fluid world where users move regularly between informal discussion and scholarly/research domains, one can consider the functional areas of linking, reference management, and weblogging to be service points on a single continuum of information gathering, study, and creation. Following a reference from a weblog or from a scholarly article of an electronic journal are each similar steps in exploring threads of related ideas.

For example the Interactive University at UC Berkeley is building the Scholar's Box [12] application to enable users to better integrate digital resources from libraries with other information sources and tools. The Scholar's Box makes it easier to create personalised and themed collections of digital cultural objects for use as research and learning materials. Benefits of such a tool include simplifying integration of digital primary source materials into teaching and learning, and simplifying integration of user-built collections with other end-user and institutional tools for managing and sharing information.

In a way, weblogs represent the informal end of the continuum from formal to informal scholarly communications: starting at the other end with peer-reviewed publications, one can imagine pre-print and e-print archives, institutional repositories, online community forums, mailing lists, and weblogs as tending to have varying degrees of formality depending on the level and character of administrative policy, peer review, and institutional stewardship brought to each. Weblogs can also be seen as a new tool for controlling and personalising both formal and informal aspects of research and teaching. Keeping Weblog pages with results of saved searches or tables of contents, for instance, is an easy way to link storage and sharing with traditional information-seeking tools. Indeed, much like bibliometric techniques for formal communication systems, tools for connecting weblogs to each other and to other information services are already in widespread use. 'TrackBack,' for example, allows a weblog author to connect their own comments directly to others' posts [13].

For instance, other tools gaining prominence include Blogdex [14], which generates a summary of popular links anywhere on the Web by analysing the outward link patterns from weblogs, and Technorati [15], which provides an impact factor-like ranking of weblogs by inbound links from other weblogs. Delicious [16], Furl [17] and the authors' analog [18] are 'shared link logs' allowing distributed individuals and groups to quickly categorise and share bookmarks and recently read links. Blogging [19] directly connects webloging to the Pubmed database by allowing users of a custom Pubmed interface to add entries for interesting citations to a shared weblog.

Many new services such as weblogs are quickly becoming mainstream, as major institutions such as Harvard Law School and MIT are bringing up public weblog services for their community members. Information-sharing innovations are also coming from within academia. The University of Minnesota Libraries, for example, has added their community webloging system UThink as a target in their link resolver system, so users can post a citation directly onto their own weblogs. In the current library software marketplace, where digital library services can include metasearch portals with citation clipboards and UThink with private weblogs connected to link resolvers, it seems clear that we are in the middle of a wave of innovation and integration of these new services. The common thread running through these innovations is that each new service helps individuals move and connect more kinds of information from more diverse resources through the various information communities in which they participate [20].

A group of IT professionals has launched India's first network of technology blogs that allows its members to create their own blogs and share knowledge on information technology named ITvidya.com, the network also hosts expert-managed blogs in areas of coding, design, database, operating systems (OS), emerging technologies, enterprise solutions, outsourcing, web and wireless technologies. "With blogs around, the web is now no more just a library, but also an interactive conversation platform allowing active participation by all users not only to read, but also write and comment," says Ajay Sanghani, founder, ITvidya.com. ITVidya claims that they will offer unique facilities like tagging of content for easy content categorization and rating content submitted by the bloggers.

Today Blogging already offers a platform for individual self expression worldwide, what is needed now is to offer easily accessible, user rated professional quality content to information seekers, through content networking. Another breakthrough idea of this project is its ability to support corporate blogging through professional content, photo blogging and well nurtured communities.

Blogs and RSS (Real Simple Syndication/Rich Site Summary) feeds and their applications in libraries are increasing exponentially. These applications range from current awareness type of settings in keeping up-to-date with new information, table of contents alerts of journal articles, feeds based on a research query in electronic databases, and news alerts from different subject areas. Other library related use of blogs and RSS feeds may include availability of new books based on selected keywords, feeds based on new subject guides, creating simple blog entries for course related useful information, and announcing library related events such as the Scholarly Communications Speaker series.

5. Concerns and Conclusions

Libraries are increasingly hesitant to support big, monolithic and centralized portal solutions equipped with an all-inclusive search interface which would only add another link to the local, customer-oriented information services. Future search services should be based on a collaboratively constructed, major shared data resource, but must come with a whole range of customizable search and browsing interfaces that can be seamlessly integrated into any local information portal, subject specific gateway or personal research and learning environment. The discussion among libraries about their strategy for discovering the academic web has only started. There is an urgent need to provide a second-generation user front-

end to these distinct services and resources that successfully integrates with how users move through and manage information in the turbulent knowledge era.

The library portal and other application-layer services that integrate and aggregate information and services across disparate systems are just the tip of the iceberg. These systems are based on infrastructures that have been designed to support higher-level user tasks. To protect our investments in current systems but at the same time make them accessible to multiple and changing needs we will have to develop an integration layer that provides adapters that can interface with existing systems. The challenge is to identify user-level services (applications) that are important to users and to identify generalizations of common programming-level services that can be developed to support those applications. At the same time it is necessary to conceptualize library technology as an integrated whole so that we can leverage information from one system for use in many applications. Programming-level services may be used to simplify access for users and when permissible use information about users to make decisions about presentation [21].

The library portals need to provide new search and navigation interfaces or improved ranking and display features for academic content. Vendors of integrated library systems have partly responded to this development and offer already separate local and central modules. New requirements for libraries have resulted in the set-up of new systems such as digital library systems, digital collection and e-print servers. The increase of systems alongside with the increased demand on financial and staff resources to maintain these systems have led to discussions within libraries and on a campus wide level in order to find out how these systems interact with each other and investigate potential duplication or even multiplication of services implemented in different systems. The current Grid-research initiatives, that address distributed, large-scale computing in a wider context, could provide valuable technology for the building of distributed data and access networks. Libraries will need to watch closely these developments and be open for collaborations.

6. References

1. Arnold, Stephen (2004), 'Information boundaries and libraries' viewed 4 Nov. 2005, <http://www.arnoldit.com/articles/elib_Feb2004_final.doc>
2. Lakos, Amos A. (2004), 'Portals in Libraries', *Bulletin of the American Society for Information Science and Technology*, vol. 31, no. 1.
3. Lossau, Norbert (2004), 'Search Engine Technology and Digital Libraries: Libraries Need to Discover the Academic Internet', *D-Lib Magazine*, vol. 10, no.6
4. Webopedia, <http://webopedia.internet.com/TERM/W/Web_portal.html>
5. <<http://hylife.unn.ac.uk/toolkit/gateport.htm>>
6. Maloney, Krisellen (2004), *Portals in Libraries: Library Technology and Planning for Change*, *Bulletin of the American Society for Information Science and Technology*, vol. 31, no. 1.
7. *ibid.*
8. *op. cit.*, Lossau, Norbert (2004)
9. Savarese, John (2005), 'Library Portals and What's Next, *Campus Technology*', viewed 4 Nov. 2005 <<http://www.campus-technology.com/mag.asp?month=5&year=2005>>
10. *ibid.*

11. Chudnov, Daniel, Jeremy Frumkin, Jennifer Weintraub, Matthew Wilcox & Raymond Yee (2004), 'Towards Library Groupware with Personalised Link Routing', *Ariadne*, no. 40, viewed on 4 Nov. 2005, <<http://www.ariadne.ac.uk/issue40/chudnov/intro.html>>
12. More information on Scholar's Box can be found at <<http://iu.berkeley.edu/IU/SB>> and <<http://raymondye.net/wiki/ScholarsBox>>
13. op. cit. Chudnov, Daniel et al. (2004)
14. Blogdex, available online at <<http://blogdex.net/>>
15. "Top 100 Technorati," available online at <<http://technorati.com/cosmos/top100.html>>
16. Delicious, available online at <<http://del.icio.us/>>
17. Furl, available online at <<http://furl.net/>>
18. unalog, available online at <<http://unalog.org/>>
19. Biologging, available online at <<http://www.biologging.com/>>
20. op. cit. Chudnov, Daniel et al. (2004)
21. op. cit. Maloney, Krisellen (2004)

About Authors



Prof. I V Malhan is at present Professor and Head at the Department of Library Science, University of Jammu. He has published books and several papers in the national and international journals. He participated in Conferences and Seminars held in Asia, Europe and the United States and supervised PhD students. He was awarded the Fulbright Fellowship to visit the USA in 1996 to study the impact of information technology on library and information science education.

E-Mail : imalhan_47@rediffmail.com



Mr. Shivarama Rao is at present Lecturer at the Department of Library Science, University of Jammu. Earlier he was a Project Staff at NCSI (National Centre for Science Information), IISc, Bangalore. He has published papers in the national and international journals. He is also actively engaged in and has been resource person at the workshops organized by the University.

E-Mail : sramashiva@yahoo.co.in