

LIBRARY, LIBRARIAN AND LIBRARY SERVICES IN WEB 2.0 ENVIRONMENT

IMRAN KHAN

HMS Central Library

Jamia Hamdard (Hamdard University), New Delhi-110062

ikhanjh@gmail.com; ikhan@jamiyahamdard.ac.in

ABSTRACT

With the extensive use of Information and Communication Technology (ICT) in the Libraries and information centres, there is a drastic change in the way information is acquired, processed, stored, accessed, disseminated and used. The emergence of more and more new technologies and applications like Web 2.0, social media, cloud computing, mobile web and new formats like e-Books, are influencing managerial decisions about the most effective plan for staff skills, budgeting and marketing. New media tools such as *Twitter, Facebook, Blogs, Wikis, Linked In, Virtual Worlds* and *RSS feeds*, have now made it necessary to offer a more customer-driven, socially rich, more interactive and collaborative model of service and content delivery in online mode. In order to provide better and relevant services according to the changing needs of users, the libraries and corporate information centres need to choose the right tools and look for the practical methods to implement these processes. This paper provides an interactive environment to explore some of the most popular and innovative tools and techniques associated with libraries, Web 2.0 and new ways of information storage and retrieval. The paper further discusses the implementation and utilization of these new technologies in the libraries and information centres and their impact on the role of librarians and the library services.

KEYWORDS: Web 2.0, Library 2.0, Librarian 2.0, Social Network, Wiki, Blog, RSS

INTRODUCTION

The introduction of dot-com in 2001 brought about new ways for people to participate on the Web in the form of new social tools. The people began to use the Web not only to find information, but also started using other applications and services like chatting, sharing photos, participating in forums, contributing ideas and building communities. Social networking websites like *Flickr*, *YouTube*, *MySpace*, and *Facebook* have all redefined social interactions on the Web. The Web has now become an integral part of the average person's social life. It has changed the people's way of thinking and communicating with one another, deepening their dependence on the Web. All these new information technologies have totally changed the needs and expectations of the users creating a big challenge to the library and information science profession to serve their users up to their expectations. Once a supplementary tool or an assistive technology, online learning now is emerging as a fast, convenient and contemporary tool for the students and teachers. Tablet PCs and availability of books on the digital platform from across the world have fuelled the growth of e-learning all over the world. Many publishers have turned to manufacturing online educational contents. In the present hi-tech era of exponential growth of information, the library profession needs to think above the paradoxical situation of limited access to information. Libraries have to adapt and adopt changing paradigms to contribute significantly to strategic institutional goals.

Information professionals have developed many new and hi-tech skills which are being increasingly applied in a diverse array of information environments. To meet the

changing information landscape, new job roles have emerged in libraries. Librarians are now working as metadata librarians, e-learning librarians, e-librarians and digital librarians. Moreover, there are increasing opportunities to apply library and information science skills to work in other settings and roles such as social media liaisons, taxonomy analysts, and user experience researchers.

PURPOSE

The purpose of this paper is to introduce the term Web 2.0, describe its development and significance, give an outline of its underlying theoretical assumptions, explore the possibilities and trends in the application of its features in libraries and study its impact on library profession and library services.

WEB 2.0

The term Web 2.0 has been reportedly first conceptualized and made popular by Tim O'Reilly and Dale Dougherty of O'Reilly Media in 2004 to describe the trends and business models that survived the technology sector market crash of the 1990s. As defined by O'Reilly, Web 2.0 is the use of the Web as a platform to build software tools that support user interaction, participation and collaboration. It is based on a set of social tools including Blogs, RSS (Really Simple Syndication), Instant Messaging, Wiki, Podcasting, Social Networking, Photo Sharing, Social Bookmarking, Tagging and Mashups. The goal of Web 2.0 is to create a Read/Write Web; that is, a Web in which users can both read and freely contribute content. The central idea of Web 2.0 is to move away from the traditional unidirectional model, toward a new user-centric bidirectional model. By using social tools, for example, dot-com companies can reach

out to expand their customer base, build communities, receive feedback and, in turn use, feedback to improve and build products. Users can interconnect, participate and contribute by using the same tools. Though its original application was in the world of business, Web 2.0 has had a significant impact on every aspect of life, including library. Business 2.0, Chemistry 2.0, Psychology 2.0, Education 2.0 and Library 2.0 are just a few of its spinoffs. Web 2.0 is a term often applied to a perceived ongoing transition of the World Wide Web from a collection of websites to a full-fledged computing platform serving web applications to end users. Ultimately Web 2.0 services are expected to replace desktop computing applications for many purposes. The old World Wide Web was based on the Web 1.0 paradigm of websites, email, search engines, and surfing while Web 2.0 is about the more human aspects of interactivity such as conversations, interpersonal networking, personalization, and individualism. It's relevance in the library world is not just limited to the public Web portals but also to workplace intranets and more crucially for greater social cohesiveness in virtual teams and global content engagement. The technologies which serve as the emerging foundation for Web 2.0 are:

- RSS (Really Simple Syndication is a family of web feed formats used to publish frequently updated works—such as blog entries, news headlines, audio, and video—in a standardized format)
- Wikis
- New and revised programming methods like AJAX (Asynchronous JavaScript and XML is the art of exchanging data with a server, and

updating parts of a web page - without reloading the whole page) and APIs (Application Programming Interface is a specification intended to be used as an interface by software components to communicate with each other)

- Blogs and Blogging
- Commentary and comments functionality
- Personalization and 'My Profile' features
- Personal media such as Podcasting and MP3 files
- Streaming media audio and video formats
- Reviews and user driven ratings
- Personalized Alerts
- Web Services
- Instant messaging and virtual reference including co-browsing
- Folksonomies, Tagging, and tag clouds
- Photos (e.g. Flickr, Picasa)
- Social networking software
- Open Access, Open Source, Open Content
- Socially driven content
- Social bookmarking (such as Delicious.com)

The technology infrastructure of Web 2.0 includes server software, content syndication, messaging protocols, standards-based browsers, and various client applications. It could be seen as the Web becoming a computing platform for serving up Web

applications to end users. A Web 2.0 site allows its users to interact with other users and to change website contents, in contrast to non-interactive websites where users are limited to the passive viewing of information that is provided to them.

LIBRARY 2.0

Library 2.0 is the application of interactive, collaborative, and multimedia web-based technologies to web-based library services and collections. In the library and information professional world, a savvier audience of users relative to the general consumer is generally dealt with. The library professionals also tend to the digital divide issues of the more challenged user. This means that what most critical users of the library don't know about or use, the library professionals can often inform them about and train them in the newest technologies that can have an impact on their success. For those users who can quickly become comfortable using technologies such as Wikis, RSS, instant messaging, news aggregators and blogs, the library professionals can help them to leverage these in making a difference in reaching their goals. Its quite clear that each and every one of the technologies listed in Web 2.0 above, vis., RSS, Wikis, blogging, personalization, podcasting, streaming media, ratings, alerts, folksonomies, tagging, social networking software, etc., could be useful in an enterprise, institutional, or community environment and could be driven or introduced by the library. The beauty of Web 2.0 and Library 2.0 is the level of integration and interoperability that is designed into the interface through the portal or intranet.

Library 2.0 is a concept of a very different library service, geared towards the needs and expectations of today's library users by making the information available wherever and

whenever the user requires it, and seeks to ensure that barriers to use and reuse the information are removed. Library 2.0 is mainly around the concept of how to use the Web 2.0 opportunities in a library environment. It is one of the major breakthroughs seen in recent times. It is a new way of providing library services through new internet technologies with emphasis on users. Library 2.0 is a loosely defined model for a modernized form of library service that reflects a transition within the library world in the way that services are delivered to users. The main principle of the Library 2.0 is in the fact that the information has to be extended from the library to the users and vice versa, to allow fast and permanent adaptation of the library services.

BASIC CHARACTERISTICS OF LIBRARY 2.0

Library 2.0 is a model for library service that encourages constant and purposeful change, inviting user participation in the creation of both the physical and the virtual services they want, supported by consistently evaluating services. It also attempts to reach new users and better serve current ones through improved customer-driven offerings. Library 2.0 can be characterized by the following:

It is user-centric: Users participate in the creation of the contents and services they view within the library's web-presence, OPAC (Online Public Access Catalogue), etc. The consumption and creation of content is dynamic, and thus the roles of librarian and user are not always clear.

It provides a multi-media experience: Both the collections and services of Library 2.0 contain video and audio components.

It is socially rich: The library's web-presence includes users' presences. There are both synchronous (e.g. Instant Messaging) and asynchronous (e.g. wikis) ways for users to communicate with one another and with librarians.

It is communally innovative: This aspect of Library 2.0 rests on the foundation of libraries as a community service, and understands that as communities change; libraries must not only change with them, but also allow users to change the library. It seeks to continually change its services, to find new ways to allow communities, not just individuals to seek, find and utilize information.

LIBRARY 2.0 AND WEB 2.0

The term Library 2.0 can be broken down into two parts, *Library* and *Web 2.0*. As 2.0 comes directly from the term Web 2.0, it is clear that the term roughly describes the relationship between Web 2.0 and libraries, i.e., $\text{Web 2.0} + \text{Library} = \text{Library 2.0}$. Library 2.0 cannot be defined solely by the characteristics that are either the characteristics of Libraries or Web 2.0 if the combination of the characteristics does not create a unique concept. It must describe a unique service model that occurs when libraries take Web 2.0 services into account. Library 2.0 describes a subset of library services designed to meet user needs caused by the direct and peripheral effects of Web 2.0. It is completely user-centric, user-driven, and innovative of Web 2.0 services. It is a library of the 21st century, rich in contents, interactivity and social activity. As Library 2.0 services are designed to meet user needs, therefore the services at public, academic, school and special libraries will all have unique user needs because of the different populations they serve.

TOOLS OF LIBRARY 2.0 AND THEIR WORKING EXAMPLES

The goal of Library 2.0 is to build a bidirectional user-centric library using Web 2.0 social tools as its foundation. When Web 2.0 first evolved, many enthusiastic librarians quickly started exploring the potential of Web 2.0 social tools. Blogs such as *The Shifted Librarian*, *Library Thing*, and *LibraryCrunch* lead the way in stimulating discussions on Web 2.0 in library perspective. When *YouTube*, *MySpace*, and *Facebook* debuted, many libraries and library organizations started using these sites to promote library services, connect with their users and offer help to them. The Library of Congress even worked with *Flickr* to make the precious national historic photographs collection accessible worldwide. Wiki is a tool designed to allow a team to work together on projects, writing documents and creating instructions without geographical and time constraints. Any member of the team can edit and contribute content from anywhere at any time. It is very easy to use and the knowledge of HTML (Hyper Text Markup Language), a web page construction language, is not required. One of the most successful examples in library land is The Biz Wiki, a Business & Economics research guide. It was created in 2005 and is maintained by Chad Boeninger, Reference & Instruction Librarian at Ohio University Libraries. This research guide is an important research tool not only for Ohio University users but also for users worldwide.

Instant Messaging (IM) is another tool that has changed the landscape of library services. A chat URL (Uniform Resource Locator) link is now an indispensable part of library homepages. Users do not need to walk up to the reference desk in person to get their questions answered; they can simply go to their library homepages and follow the

chat link. They can immediately ask questions and receive instant answers. In addition, many instant messaging tools can now be embedded in any webpage on a library website. Because users can receive instant feedback and there is no limitation on physical location, instant messaging adds significant value to the traditional walk-in reference service and has become a very popular and effective tool for library users. Social bookmarking along with tagging and tag clouds have also gained momentum and have stimulated advancements in the library profession. *PennTags* is one such innovation, created by Michael Winkler, then Library Web Manager, and Laurie Allen, then Research and Instruction Services Librarian at the University of Pennsylvania Libraries in 2006. It allows users to bookmark articles, books and other materials of interest with a single click while conducting searches in library databases and catalogues. Users can then further organize their bookmarks, generate citations and share them with classmates and friends. Teachers can share their bookmarks with students and create recommended reading lists for their courses. The best part of this tool is that users can assign their own terms, called folksonomies, rather than library-established terms to tag their bookmark entries. In addition, this tool can generate a list of most-searched terms from the entire system at any moment and display them on the main page, functioning as a dynamic index list. The list can be displayed in different font sizes, with the largest font representing the most-used terms. Because the different font sizes make the list look like a cloud, these dynamic lists have been named tag clouds. Although Web 2.0 social tools provide many advantages, each has its own weaknesses when applied in the libraries. One major weakness is lack of compatibility stemming

from the fact that they have generally been developed independently. Libraries need a more integrated system equipped with Web 2.0 social tools so that their users can use them in an integrated manner. With this in mind, Libguides and Web 2.0 library online catalogues emerged around four years ago. Libguides is a subscription based hosted service that provides built-in Web 2.0 tools. Librarians can use this service to create subject specific research guides with interactive features, multimedia, communities and sharing capabilities. It gives librarians an edge in organizing library resources, reaching out to users and encouraging interactive learning. URL links and database search boxes can be presented on the same web page, providing convenient access to library resources. The Libguides service has been very popular in library profession, with a large number of libraries in various countries currently using it. Based on the idea of Web 2.0, Amazon.com and Google's Single Box Searches, the Web 2.0 online library catalogue or next generation publicly accessible catalogue is another noteworthy innovation. This new online catalogue is underpinned by a one-stop search engine with the capability to retrieve results from all library resources at once, including books, e-Books, journal articles, videos, databases and other media. With this new catalogue, users do not need to switch from one resource to another to find their required materials. Users can narrow their results to a small subset by using limiters such as subject, format and genre. When a record is selected, an additional link provides recommended resources based on other selections from users who selected the same record. Web 2.0 social tools are also built into this online catalogue so that users can chat with librarians, write comments, rate resources and write reviews. Librarians can

publish blog posts to promote library resources, provide instructions and invite users to participate in discussions directly from the online catalogue. Because of its high cost, however, few libraries have implemented it so far.

Examples:

Library of Congress on Flickr

http://www.flickr.com/photos/library_of_congress/

Ohio State University Biz Wiki

http://www.library.ohiou.edu/subjects/bizwiki/index.php/Main_Page

MaxChat (an Instant Messaging Service of Maxwell Library, Bridgewater State University)

<http://www.bridgew.edu/Library/>

PennTags for University of Pennsylvania Library Users

<http://tags.library.upenn.edu/>

LibGuides Community Site

<http://libguides.com/community.php?m=i&ref=www.libguides.com>

Cornell University Library Guides (Research Guides) hosted by SpringShare

<http://guides.library.cornell.edu/>

UW WorldCat of Washington University Libraries

<http://guides.lib.washington.edu/content.php?pid=156369&sid=1352518>

BASIC COMPETENCIES AND SKILL REQUIREMENTS FOR A LIBRARIAN 2.0

In the last few years, advancements in information services have far gone beyond those of earlier decades. These have a major impact in the way information specialists, and

their patrons, access data, redefining both of their roles in information gathering and research. As a general statement, the core role of the information specialist is changing from information gatekeeper to information guru. A librarian in Web 2.0 technology environment is required to act as information enabler and knowledge creator. As an information enabler, the Librarian 2.0 needs to have the ability of transferring ownership of searches to patrons. This involves deploying simpler tools to the end-user, and teaching how to best use them, creating patron ability. While these two are related, they have markedly different core competencies. In deploying simpler applications, Librarian 2.0 is required to have a working knowledge of not only the tools to be deployed, but also the technology infrastructure used behind it. Therefore, this requires a basic knowledge of IT and intranet fundamentals – ideas such as network security, routing and server-side applications. Along with this, another core competency is fluency in web development languages in order to better integrate these with the existing intranet and to develop custom tools. Librarian 2.0 also needs to possess the ability to publicize the availability of information resources and to ensure that they meet customer needs, reactively and proactively. Moreover, Librarian 2.0 is required to possess the ability to retrieve applicable data in a periodic and timely manner, and properly disseminate it to the patrons. He is also required to have awareness of current knowledge sharing technologies and ability to appropriately apply these technologies for the benefit of end-users.

Based on the above, the Librarian 2.0 should attempt to:

- Understand the power of the Web 2.0 opportunities;

- Learn the major tools of Web 2.0 and Library 2.0;
- Combine e-resources and print formats and is container and format agnostic;
- Is device independent and uses and delivers to everything from laptops to PDAs (Personal Digital Assistant) to iPods;
- Develop targeted federated search and adopts the OpenURL standard;
- Connect people and technology and information in context;
- Doesn't shy away from non-traditional cataloguing and classification and chooses tagging, tag clouds, folksonomies, and user-driven content descriptions and classifications where appropriate;
- Embrace non-textual information and the power of pictures, moving images, sight, and sound;
- See the potential in using content sources like the Open Content Alliance, Google Print, and Open WorldCat;
- Connect users to expert discussions, conversations, and communities of practice and participates there as well;
- Use the latest tools of communication (such as Skype) to connect content, expertise, information coaching, and people;
- Use and develops advanced social networks to enterprise advantage;
- Connect with everyone using their communication mode of choice – telephone, Skype, IM, SMS, texting, email, virtual reference, etc.;
- Encourage user driven metadata and user developed content and commentary;
and

- Understand the wisdom of crowds and the emerging roles and impacts of the blogosphere, Web syndicasphere and wikisphere.

Thus, in the highly technical environment of Web 2.0, today's librarian is facing added challenges due to recent technological growth, necessitating a professional that is better equipped and broadly educated than one just ten years ago. Librarian 2.0 needs to be a credible source for understanding and imparting knowledge of new technological developments. Willing to grow with job, librarian 2.0 is required to be interested in what is happening around them, and scan the horizon to be aware of the outside world. An essential element, research, is a way for librarian 2.0 for making best decisions, best practices, and establishing benchmarks. Good at negotiation and diplomacy, librarian 2.0 is required to be able to use whatever language is needed to persuade or influence the target audience to their point of view. They require being adaptable, flexible, persistent, and resilient.

DISCUSSION AND CONCLUSION

With the rapid growth in the Information Communication Technology (ICT), the information environment within which libraries find themselves is continuously changing. These changes offer great opportunities for progressive libraries to reach out far beyond the boundaries of their buildings and websites, and to engage with an increasingly literate body of information consumers. The new techniques and technologies, which are emerging, are suitable for deployment in the libraries, to enhance the ways of making their data work for themselves and their clients/users. Recently, librarians have struggled to understand their relationship to a new breed of Web services that, like

libraries, connect users with the information they require. These services, known as Web 2.0, do have effects on library services. Web 2.0 represents an emerging suite of applications that hold huge potential in enriching communication, enabling collaboration and nurturing innovation. They offer new service models, methods, and technologies that can be adapted to improve library services. Further, because of widespread use of these services, there are cultural changes affecting library users' information seeking behaviors, communication styles and expectations. The term Library 2.0 has been introduced into the professional language of librarianship as a way to discuss these changes. However, little work has been done up till now to research Web 2.0 applications in library websites. The concept of Library 2.0 is still under constant discussion in the library world.

Library 2.0 can be a scary term for the librarians who aren't really involved into technology. It is not primarily about machines and software but it is about using the best tools and ideas to provide the best possible services to the users. It is an exciting concept which can create a conversation that creates the next generation of library websites, databases, OPACs, intranets and portals in a way that allows the end user to survive. Library 2.0 is a conversation about some of the human aspects of this emerging environment. To take advantage of the concepts inherent in Library 2.0, it is necessary not to shy away from adding advanced functionality and features directly into the content. This will provide the context and workflow-oriented features that users will demand or are demanding already.

Library 2.0 is a powerful idea that finds itself in an awkward predicament. It is an idea that has emerged out of what amounts to a separate discourse within librarianship, that of younger, web-centric librarians who have often have a sense that they are remaking the profession from the ground up for the digital future. The mainstream of librarianship, the older side of the profession, has by now heard of Library 2.0, but either understands it poorly or not at all. They may be used to the modes of practice that in some cases need to be eliminated completely, but are also the bearers of much important knowledge – of principles and practices – on which the future of librarianship depends. The younger, web-centric generation of librarians is interested in this knowledge in theory, but to the extent that its discourse is separate and web-based, it is not communicating with the older generation to the extent that's necessary. It is strongly felt that the libraries and the culture of librarianship must be extended into networked communication, with the principles of librarianship to preserve the existence of a freely-accessible, non-commercial information and learning space as an alternative to the consumer capitalist information and entertainment space offered by media giants. The basic idea of Library 2.0, to transform library services by making them more personalized, more interactive, and more web-based along Web 2.0 lines, has a logic to it that is ineluctable and exciting.

The Web 2.0 movement is laying the groundwork for exponential growth in almost each and every aspect of life including information and knowledge. Almost all the businesses, universities, colleges, institutions, schools and even healthcare providers come to depend more heavily on the free and ready flow of information. This has necessitated

the strong need that the librarians should develop many new skills to handle and disseminate information and knowledge in Web 2.0 environment. Library profession faces a shortage of people willing and ready to take leading positions in the research libraries of tomorrow. A librarian today needs to be familiar with all the different ways to communicate with the users and keep up to date with information and emerging technologies. Because librarians deal with information, there is no getting away from the use of information technology. To connect with today's library users, librarians need to implement and stay abreast of the latest communications technologies and tools. They also need to look at things on a higher level, study user behaviour, and adapt new technologies on a library-wide level to keep pace with new user habits and behaviour. Some of the skills which are needed to be developed include usability testing, Web analytics, and Web 2.0 skills such as the use of RSS and social media. It is anticipated that knowledge of data curation, open access repositories and cited reference will become increasingly important. Librarian 2.0 needs a complex mix of transferable skills, including teamwork, communication, business skills, lifelong learning and personal traits such as creativity, flexibility, adaptability and persistence.

Altogether, the use of these Web 2.0 technologies and applications, along with others not here mentioned and others not yet invented, will constitute a meaningful and substantive change in the history of libraries. The library's collection will change, becoming more interactive and fully accessible. The library's services will change, focusing more on the facilitation of information transfer and information literacy rather than providing controlled access to it. On the basis of the above discussion and

findings, this paper promotes a focused definition for Library 2.0 as '*The application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections*'. The best conception of Library 2.0 at this point of time would be a social network interface that the user designs. It is a personalized OPAC that includes access to Instant Messaging, RSS feeds, blogs, wikis, tags, and public and private profiles within the library's network. It is a virtual reality of the library, a place where one can not only search for books and journals, but interact with a community, a librarian, and share knowledge and understanding with them. Library 2.0 will move the full suite of library services into the electronic medium. The library has had a web-presence for many years, and with Library 2.0, its patrons will be joining it.

Library 2.0 is a change of a nature close to the tradition and mission of libraries. It enables the access to information across society, the sharing of that information, and the utilization of it for the progress of the society. Despite this change fitting so well with the history of libraries and their mission, it is still a major paradigmatic shift for librarianship to open not just access to their catalogs and collections, but access to their control. Library 2.0 demands libraries to focus less on secured inventory systems and more on collaborative discovery systems. There is perhaps a great synchronicity between librarianship and Web 2.0, but viewed holistically, Library 2.0 will revolutionize the profession. Rather than creating systems and services for patrons, librarians will enable users to create them for themselves. A profession steeped in decades of a culture of control and predictability will need to continue moving towards embracing facilitation and ambiguity.

SUGGESTIONS

The social network 2.0 is not about devoting many hours work to the Internet, but it is necessary to keep up with the tools and resources of social networks, to take part in them strategically, to know how to communicate the essential ideas, and to maintain a consistent and regular presence. With all these activities, academic librarians, especially those who work with bibliographic information, have a vast world of new applications at their disposal. The exciting results of implementing these applications can significantly benefit the libraries and educational institutions. In the light of the present study, an obvious first step would involve further research that explores the existing cultures and attitudes within the profession and what it means to become a Library and Information Science professional in the 21st century.

For the enhanced deployment of Web 2.0 in the libraries there will be a strong requirement of support from the library management because of the involvement of financial, infrastructural, and training implications. As such, educating and convincing the various parties on how Web 2.0 applications can enhance library services is crucial. Some librarians are still skeptical on the application of social networking and instant messaging tools. This could indicate their concerns on the possible impacts of allowing users to have collaborative network and instant communications with the librarians by using such tools. Thus, librarians need to be exposed and educated on how to reposition them in this age of Library 2.0 environment. The resistance could be due to their anxiety that these tools will empower users in ways that will change how libraries used to operate and what are to be expected from librarians. It is also suggested that

the Library and Information Science education must respond to the changing needs of technological advancement in libraries today. Thus, Web 2.0 technology tools and applications must be a major component in the Library and Information Science curriculum.

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