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Web 2.0 and Library 2.0 Technology: Implications in Library

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Abstract

This article posits a definition and theory for "Library 2.0". It suggests that recent thinking describing the changing Web as "Web 2.0" will have substantial implications for libraries, and recognizes that while these implications keep very close to the history and mission of libraries; they still necessitate a new paradigm for librarianship. The paper applies the theory and definition to the practice of librarianship, specifically addressing how Web 2.0 technologies such as synchronous messaging and streaming media, blogs, wikis, social networks, tagging, RSS feeds, and mashups might intimate changes in how libraries provide access to their collections and user support for that access. This paper attempts to resolve some of this controversy by suggesting a definition and theory for Library 2.0, as well as providing examples of its substantial implications for library and librarianship.

Key-words: Web 2.0; Library 2.0; Blog, Wiki; Streaming Media; Social Network; Tagging; RSS; Mashup

Introduction

While the term is widely defined and interpreted, "Web 2.0" was 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 (O'Reilly, 2005). The companies, services and technologies that survived, they argued, all had certain characteristics in common; they were collaborative in nature, interactive, dynamic, and the line between the creation and consumption of content in these environments was blurred (users created the content in these sites as much as they consumed it). The term is now widely used and interpreted, but Web 2.0, essentially, is not a web of textual publication, but a web of multi-sensory communication. It is a matrix of dialogues, not a collection of monologues. It is a user-centered Web in ways it has not been thus far.

The implications of this revolution in the Web are enormous. Librarians are only beginning to acknowledge and write about it, primarily in the "biblioblogosphere" (weblogs written by librarians). Journals and other more traditional literatures have yet to fully address the concept, but the application of Web 2.0 thinking and technologies to library services and collections has been widely framed as "Library 2.0" (Miller 2005a; 2005b; 2006a; 2006b; Notess, 2006). Most writers on Library 2.0 would agree that much of what libraries adopted in the first Web revolution are static. For example, online public access catalogs (OPACs) require users to search for information, and though many are beginning to incorporate Web 2.0 techniques by gathering data regarding a user (checked-

out items, preferred searches, search alerts), they do not respond with recommendations, as does Amazon.com, a more dynamic, Web 2.0 service. Similarly, the first generation of online library instruction was provided via text-based tutorials that are static and do not respond to users' needs nor allow users to interact with one another. These, however, have begun evolving into more interactive, media-rich tutorials, using animation programming and more sophisticated database quizzes. Libraries are already moving into Web 2.0, but the move has only just begun.

What is Web 2.0

The term Web2.0 refers to the development of online services that encourage collaboration, communication and information sharing. It represents a shift from the passive experience of static "read only" web pages to the participatory experience of dynamic and interactive web pages. In other words, Web2.0 reflects changes in how we use the web rather than describing any technical or structural change.

Service Types	Example
Social Network	Facebook, Bebo
Vedio and Photo Sharing	Youtube, Flickr
Blogging	Blogger, Wordpress
Microblogging	Twitter, Tumblr
Social Bookmarking	Del.icio.us, Digg
Wikis	Peanut Butter, Tikiwiki
Resource Organisation	Page Flakes, Netvibes

Many Web2.0 services, such as the examples provided, are often referred to as "social media" due to their role in supporting communication and building online communities.

Basic Feature of Web 2.0:

The web as a Platform

It means we don't need to download and install on our own computer. In web 2.0 environment it is possible to put a document up on to the web and using web-based word processor all our colleagues can make changes to it. So actual document shared and application is shared on the web. For example we can create a power point presentation, then load to utility such as slide share at www.slideshare.net and allow comments or even edit online.

Collective Intelligence

The web 2.0 resources are often referred to as ways in which "wisdom of the crowd" can be harnessed. This concept often referred to as "radical trust" and is at least in part based concept that people will either do nothing bad, or will act for the good for all. The role of user is much interesting and challenging now. User are able to combine materials for themselves to the extent that they do not need to know how to write websites or gather data from different sources while a user need to think about what they want to create.

Everything is β

We are all now fairly used to seeing products in "beta test mode". It means in an unfinished version. Google for example often keeps products in that state for months if not years. Improvements or changes will therefore be ongoing, with the product growing originally and changing according to the needs of the user own the course of time.

Web 2.0 and Future-proofing

Given the rapid pace of technological change, in today's information environment it is important to develop services that are adaptable and forward- looking. Although it is true to say that there are no guarantees that specific Web2.0 services will be around in the future, it is clear that they mark a perceptible change in how the web is used. It is therefore important that library services adapt to these services in order to keep up with users' demands and expectations if libraries do not keep up with emerging technologies, continuously striving to provide responsive services, it will become increasingly difficult to catch up. Thus, libraries could be at risk of providing out-of-date and irrelevant services that appeal to a decreasing user group.

According to Huge Beattie, Librarian Clydebank College

"Users don't want to interact with the library on Web2.0 sites." "Web 2.0 tools have allowed for increased participation amongst our staff and students. I like the way that Web2.0 has opened up many doors to the library for our staff & students. I think it's important that everyone involved in delivering library services realises the importance of Web2.0 and makes the most of this opportunity to communicate and co-operate with the rest of the world."

A further challenge lies in ensuring adequate training and support for library staff. Technology advances at such a high speed that it can be difficult to keep pace with developments. We hope that this guide, and the associated Slainte2.0 website (http://www.slainte.org.uk/slainte2/index.html), will provide librarians with the necessary information and support required to approach new technologies with confidence. The website will be developed to become a source of up to the minute information on

developments within Scottish library services, as well as a showcase for examples of good practice and innovation.

Characteristics of Web 2.0

- Web 2.0 permits the building of virtual applications, drawing data and functionality from a number of different source as appropriate.
- Web 2.0 is participative. The traditional web has tended to be somewhat one-sided with a flow of content form provider to viewers; it allows the user to actively participate online by means of blogging, sharing file or equivalent.
- Web 2.0 applications are modular, with developers and users able to pick and choose from a set of inter-operating components in order to build something that meets their needs.
- User can own the data on a Web 2.0 site and exercise control over that data.
- Web 2.0 is smart application which will be able to capture user's knowledge and deliver services to satisfy their needs.
- Web 2.0 is built upon trust, whether that is trust placed in individuals, in assertions or in the users and reuse of data.
- Web 2.0 is about sharing: code, content, ideas.

Weakness of Web 2.0

The emergence of web 2.0 has brought with it collaboration on a global scale, which has been a really great thing that has led to sites like Wikipedia, but it also has a dark side: copyright infringement. One issue with web 2.0 copyright infringement is that most of the offenders do not even realize what they are doing or that it is wrong. The popularity of blogging and the ease at which articles and images can be passed around have made it very simple to inadvertently commit copyright infringement. Creative commons is a popular alternative to the "all rights reserved" copyright license that we are all familiar with. Creative commons allows the copyright holder to choose from multiple licenses that describe what rights are being offered in very simple language that is easy to understand. The copyright holder can choose to offer rights for any use, or just non- commercial uses, and they can even offer the right to modify the work to suit the needs of those using it. There are some basic etiquette guidelines that can be followed. For articles, users only use a small part of the text and then link to the rest of the article. In this way, it falls under "fair use", and most writers are happy to have the link back. Clip marks are also usually used since it 'clipped'. For images, one should always check to see what sort of copyright restrictions or Creative Commons license is being used for the image. When in doubt, user can attribute the image with a link back to the original and let the copyright owner know that he has linked the work so that they can speak up if they have any objections (Mangala Hirwade 2010).

Benefits of Web2.0

Reaching your audience

The global nature of web based services means that libraries can reach a vast audience, serving more people in the virtual sphere than would be possible at a physical location. For example, by establishing a presence on social media websites, libraries can reach beyond the walled garden' to interact with users in online spaces that they are already visiting, rather than passively waiting for users to seek us out. This presents opportunities to appeal to difficult to reach user groups, such as teenagers or young males, who are traditionally less likely to visit the physical library building. A strong web presence, including representation on social media sites, improves awareness of library services and contributes to a progressive and modern image, which may in turn lead Developing services

Developing Services

Static WebPages are useful for presenting information about your service but don't allow for the interaction of users. The integration of Web2.0 services, however, could enable you to deliver parts of your service online. You could try hosting book discussion groups using a blog or wiki and providing service updates or marketing events using Twitter. Some libraries have produced promotional videos for YouTube, which are inexpensive to make and could appeal to difficult to reach groups. For more ideas and examples, see the Slainte2.0 website.

Raising awareness and promotion

Web2.0 services can be updated quickly and published instantly. This means that time delays associated with traditional web publishing, where IT departments often retain control over website content, can be sidestepped. For example, by using blogs or micro blogs, librarians can go straight to the user with news and up to date information related to new services, materials or service developments. A presence on social media websites can provide cost effective marketing opportunities and invaluable PR for your library service. This is particularly significant given the serendipitous nature of such services, which increases the chance of your message reaching a new audience.

Professional development

Librarians have been using the internet to communicate, share ideas and offer support for a long time, mainly by using the email network. The advent of Web2.0 technologies presents new opportunities for large scale professional collaboration and cooperation to increased physical visits. Many librarians now use Twitter, for example, to get information about activities and initiatives going on elsewhere; and to share ideas or ask colleagues for support. This rapidly expanding network draws on the experience of

colleagues at an international level, allowing for the widespread sharing of information and expertise, which then feeds into service developments at a local level.

Library 2.0

According to Miller (2005a), "Library 2.0" is a term coined by Michael Casey on his LibrayCrunch blog. Though his writings on Library 2.0 are groundbreaking and in many ways authoritative, Casey (2006) defines the term very broadly, arguing it applies beyond technological innovation and service. In addition to Casey, other blogging librarians have begun conceptually exploring what Library 2.0 might mean, and because of this disparate discussion with very wide parameters, there is some controversy over the definition and relative importance of the term. The nature of this controversy Lawson (2006), Peek (2005), and Tebbutt (2006) explore and begin to adequately rectify, and Crawford (2006) provides a very thorough account of the ambiguity and confusion surrounding the term, partially suggesting that there is nothing inherently novel about the idea. There is simply no need to use the term "Library 2.0" in these environments. It is a much more useful theory if it is focused on web-services, much as Abrams (2005) has defined it.

A theory for Library 2.0 could be understood to have these four essential elements:

- It is user-centered. Users participate in the creation of the content and services they view within the library's web-presence, OPAC, 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. While this is not often cited as a function of Library 2.0, it is here suggested that it should be.
- It is socially rich. The library's web-presence includes users' presences. There are both synchronous (e.g. IM) and asynchronous (e.g. wikis) ways for users to communicate with one another and with librarians.
- It is communally innovative. This is perhaps the single most important aspect of Library 2.0. It rests on the foundation of libraries as a community service, but understands that as communities change, libraries must not only change with them, and they must 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.

The library 2.0 encompassing several technologies and services like:

Blogs and wikis:

Blogs and wikis are fundamentally 2.0, and their global proliferation has enormous implications for libraries. Blogs may indeed be an even greater milestone in the history of publishing than web-pages. They enable the rapid

production and consumption of Web-based publications. In some ways, the copying of printed material is to web-pages as the printing press is to blogs. Blogs are HTML for the masses. A blog or weblog is a powerful two way web based tool. A blog is a website where library users can enter their thoughts, ideas, suggestions, and comments. Any library user can publish a blog post easily and cheaply through a web interface, create "What's New" for users, marketing of Information, user conversation about the services and resources, Post the meetings/conferences output, Place the discussion forum, and any reader can place a comment on a blog post. Wikis are essentially open web-pages, it is an online encyclopaedia where any registered user can write, amend or otherwise edit articles in the library world well note.

RSS Feeds (Really Simple Syndication)

Libraries are creating RSS feeds for users to subscribe to, including updates on new items in a collection, new services, and new content in subscription databases. RSS feeds and other related technologies provide users a way to syndicate and republish content on the Web. Users republish content from other sites or blogs on their sites or blogs, aggregate content on other sites in a single place, and ostensibly distill the Web for their personal use. Such syndication of content is another Web 2.0 application that is already having an impact on libraries, and could continue to do so in remarkable ways. Already libraries are creating RSS feeds for users to subscribe to, including updates on new items in a collection, new services, and new content in subscription databases. They are also republishing content on their sites. Varnum (2006) provides a blog that details how libraries use RSS feeds for patron use.

But libraries have yet to explore ways of using RSS more pervasively. A new product from a company called Blog Bridge, BlogBridge: Library (BBL), "is a piece of software that you can install on your own server, inside your firewall. It's not the content of the library (the books), it's the software to organize the library (the building)." While BBL's potential for libraries has yet to be determine due to its being brand new, it is conceivable that this syndication will replace browsing and searching through library websites for content. BBL and similar RSS aggregator applications, installed in a library's system and coupled with the social network of the library, will enable users to have a single, customized, personal library page that syndicates all the library content of interest to them and their research, eliminating irrelevant information. And users will, of course, control that page and that content.

Mashups

Library 2.0 is a Mashups. It is a hybrid of blogs, wikis, streaming media, contentaggregators, instant messaging, and social networks. It is a library for the 21st century rich incontent, interactivity, and social activity. Mashups are perhaps the single conceptual underpinning to all the technologies discussed in this article. They are

ostensibly hybrid applications, where two or more technologies or services are conflated into a completely new, novel service. Retrivr, for example, conflates Flickr's image database and an experimental information architecture algorithm to enable users to search images not by metadata, but by the data itself. Users search for images by sketching images. In some ways, many of the technologies discussed above are mashups in their very nature. Another example is WikiBios, a site where users create online biographies of one another, essentially blending blogs with social networks.

Library 2.0 is a mashup. It is a hybrid of blogs, wikis, streaming media, content aggregators, instant messaging, and social networks. Library 2.0 remembers a user when they log in. It allows the user to edit OPAC data and metadata, saves the user's tags, IM conversations with librarians, wiki entries with other users (and catalogs all of these for others to use), and the user is able to make all or part of their profile public; users can see what other users have similar items checked-out, borrow and lend tags, and a giant user-driven catalog is created and mashed with the traditional catalog.

Library 2.0 is completely user-centered and user-driven. It is a mashup of traditional library services and innovative Web 2.0 services. It is a library for the 21st century, rich in content, interactivity, and social activity.

Tagging

It is essentially enables users to create subject headings for the object at hand. Itallows users to add and change not only content (data), but content describing content (metadata).Ex: In Flickr, users tag pictures. In Library Thing, they tag books. The user responds to the system, the system to the user. This tagged catalog is an open catalog, acustomized, user-centered catalog.

Tagging essentially enables users to create subject headings for the object at hand. As Shanhi (2006) describes, tagging is essentially Web 2.0 because it allows users to add and change not only content (data), but content describing content (metadata). In Flickr, users tag pictures. In LibraryThing, they tag books. In Library 2.0, users could tag the library's collection and thereby participate in the cataloging process.

Tagging simply makes lateral searching easier. The often-cited example of the U.S. Library of Congress's Subject Heading "cookery," which no English speaker would use when referring to "cookbooks," illustrates the problem of standardized classification. Tagging would turn the useless "cookery" to the useful "cookbooks" instantaneously, and lateral searching would be greatly facilitated.

Of course, tags and standardized subjects are not mutually exclusive. The catalog of Library 2.0 would enable users to follow both standardized and user-tagged subjects; whichever makes most sense to them. In turn, they can add tags to resources. The user responds to the system, the system to the user. This tagged catalog is an open catalog, a customized, user-centered catalog. It is library science at its best.

Social Networks

Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium. Users can createaccounts with the library network. These networks would enable users to choose what is publicand what is not.

Social networks are perhaps the most promising and embracing technology discussed here. They enable messaging, blogging, streaming media, and tagging, discussed later. MySpace, FaceBook, Del.icio.us, Frappr, and Flickr are networks that have enjoyed massive popularity in Web 2.0. While MySpace and FaceBook enable users to share themselves with one another (detailed profiles of users' lives and personalities), Del.icio.us enables users to share Web resources and Flickr enables the sharing of pictures. Frappr is a bit of a blended network, using maps, chat rooms, and pictures to connect individuals.

Other social networks are noteworthy as well. LibraryThing enables users to catalog their books and view what other users share those books. The implications of this site on how librarians recommend reading to users are apparent. LibraryThing enables users, thousands of them potentially, to recommend books to one another simply by viewing one another's collections. It also enables them to communicate asynchronously, blog, and "tag" their books.

It does not require much imagination to begin seeing a library as a social network itself. In fact, much of libraries' role throughout history has been as a communal gathering place, one of shared identity, communication, and action. Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium. Users can create accounts with the library network, see what other users have in common to their information needs, recommend resources to one another, and the network recommends resources to users, based on similar profiles, demographics, previously-accessed sources, and a host of data that users provide. And, of course, these networks would enable users to choose what is public and what is not, a notion that could help circumvent the privacy issues Library 2.0 raises and which Litwin (2006) well enumerates.

Of all the social aspects of Web 2.0, it could be that the social network and its successors most greatly mirror that of the traditional library. Social networks, in some sense, are Library 2.0. The face of the library's web-presence in the future may look very much like a social network interface.

Streaming Media

The streaming of video and audio media is library instruction delivered online has begun incorporating more interactive, media-rich facets. The static, text-based explanation coupled with a handout to be downloaded is being supplanted by more experiential tutorials. The streaming of video and audio media is another application that many might consider Web 1.0, as it also predates Web 2.0 thinking and was widely employed before many of the following technologies had even been invented. But for reasons similar to synchronous messaging, it is here considered 2.0. Certainly, for libraries

to begin maximizing streaming media's usefulness for their patrons, 2.0 thinking will be necessary.

As mentioned, library instruction delivered online has begun incorporating more interactive, media-rich facets. The static, text-based explanation coupled with a handout to be downloaded is being supplanted by more experiential tutorials. The Association of College and Research Libraries' Instruction Section provides a database of tutorials, many of which are Web 2.0 in their nature, called <u>Peer Reviewed Instructional Materials Online</u> (PRIMO).

Many of these tutorials use Flash programming, screen-cast software, or streaming audio or video, and couple the media presentation with interactive quizzing; users respond to questions and the system responds in kind. These tutorials are perhaps the first of library services to migrate into more the more socially rich Web 2.0. Most, if not all, however, do not generally provide a means by which users can interact with one another, nor directly with librarians. This fact marks a possible potential for the continued development of these tutorials. These could take the form of multi-media chat rooms or wikis, and users will interact with one another and the learning object at hand, much as they would in a classroom or instruction lab.

Another implication of streaming media for libraries is more along the lines of collections instead of services. As media is created, libraries will inevitably be the institutions responsible for archiving and providing access to them. It will not be enough to simply create "hard-copies" of these objects and allow users to access them within the confines of the library's physical space, however. Media created by the Web on the Web belongs on the Web, and libraries are already beginning to explore providing such through digital repository applications and digital asset management technologies. Yet these applications are generally separate from the library's catalog, and this fracture will need to be mended. Library 2.0 will show no distinction between or among formats and the points at which they may be accessed.

Web 3.0

It is a term used to describe the future of the World Wide Web. Following the introduction of the phrase web 2.0 as a description of the recent evolution of the web, many technologies, journalists, and industry leaders have used the terms web 3.0 to hypothesize about a future wave of Internet innovation. Nova Spivack,(2006) defined web 3.0 as the third decade of the web (2010-2020) during which he suggested several major complementary technology trends including: Transformation, Ubiquitous connectivity, Network computing ,Open technologies, Open identity, The intelligent web, Distributed databases, Intelligent applications Etc...

Recommendations

Following recommendations are made as follows.

1. Library school should integrate the Web 2.0 applications in teaching the IT courses. Thus the future information professionals will get awareness about the potential usage of these technologies;

2. Hands on practice workshops should be organized by the library schools and professional organizations in india.

3. National, academic and special libraries should include the Web 2.0 components on their websites. Library and Information Science Journals/Newsletters and magazines should be available through RSS on their websites;

4. Twitter is a very popular service in libraries of the world for the provision of Current Awareness Service (CAS) among subscribers/users. The cellular companies should provide the Twitter Feeds service on Cell Phones in Pakistan as well, so that the real benefit of Twitter may be availed.

Conclusion

The library's collection will change, becoming more interactive and fully accessible. The library Services will change, focusing more on the facilitation of information transfer and information literacy rather than providing controlled access to it. All together, 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. The best conception of Library 2.0 at this point in time would be a social network interface that the user designs. It is a personalized OPAC that includes access to IM, RSS feeds, blogs, wikis, tags, and public and private profiles within the library's network. It is 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 1.0 moved collections and sparse services into the online environment, and Library 2.0 will move the full suite of library services into this 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 not about searching, but finding; not about access, but sharing. Library 2.0 recognizes that human beings do not seek and utilize information as individuals, but as communities. Some examples of the move from Library 1.0 to Library 2.0 include:

- Email reference/Q&A pages ---> Chat reference
- Text-based tutorials ---> Streaming media tutorials with interactive databases
- Email mailing lists, webmasters ---> Blogs, wikis, RSS feeds
- Controlled classification schemes ---> Tagging coupled with controlled schemes
- OPAC ---> Personalized social network interface
- Catalogue of largely reliable print and electronic holdings ---> Catalogue of reliable and suspect holdings, web-pages, blogs, wikis, etc.

It is, finally, also necessary to consider that the Web will continue to change rapidly for some time. Web 2.0 is an early one of many. Libraries must adapt to it, much as they did the Web originally, and must continually adapt for the foreseeable future. In this "perpetual beta" (O'Reilly, 2005), any stability other than the acceptance of instability is insufficient.

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