

Web 2.0 and Library 2.0

G Sivakumar

Abstract

Internet's rapid growth and broad penetration, along with affordable enabling Web 2.0 technologies, has not only democratized access to information but also catalyzed open access publishing which has contributed majorly to the explosion of freely available digital information. This phenomenon poses tremendous challenges, and opportunities, for Libraries and Librarians in delivering on their core mission of facilitating research, teaching, and learning in discovering, collecting, organizing and preserving invaluable knowledge from this vast information base. In this paper we explore how Web 2.0 technologies can be effectively harnessed for the evolution of libraries to their 2.0 version.

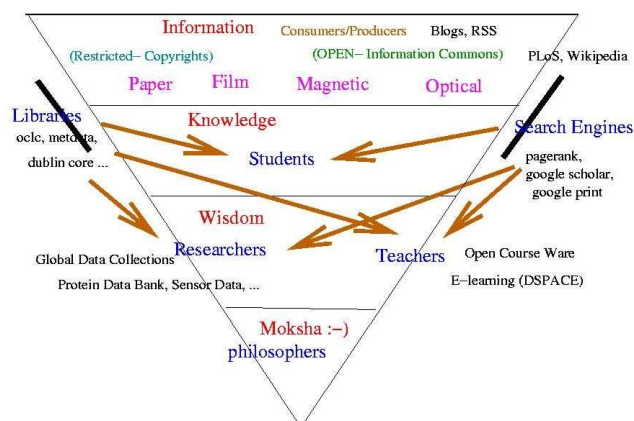
1. Introduction

Information explosion [1], caused mainly by affordable computing and Internet's rapid growth poses tremendous challenges for Libraries in particular.

Table 12: Worldwide production of original information, if stored digitally, in terabytes circa 2002. Upper estimates assume information is digitally scanned, lower estimates assume digital content has been compressed.

Storage Medium	2002 Terabytes Upper Estimate	2002 Terabytes Lower Estimate	1999-2000 Upper Estimate	1999-2000 Lower Estimate	% Change Upper Estimates
Paper	1,634	327	1,200	240	36%
Film	420,254	76,69	431,690	58,209	-3%
Magnetic	5,187,130	3,416,230	2,779,760	2,073,760	87%
Optical	103	51	81	29	28%
TOTAL:	5,609,121	3,416,281	3,212,731	2,132,238	74.5%

Source: How much information 2003



(a) Information Growth

(b) Information Hierarchy

Figure 1. Information Explosion

Although slightly dated, the 2003 study on How much information [2] draws the interesting conclusion that “ninety-two percent of the new information generated was stored on magnetic media, mostly in hard disks.” While there is still a role for paper and printed information, libraries will quickly lose their relevance if they continue to be only brick and mortar repositories of books and printed matter.

Figure 1(b) illustrates two different approaches to extract knowledge from the information overload. On the left is the top-down approach of modern libraries [3] which are becoming “places to get un-restricted access to information in many formats and from many sources. In addition to providing materials, they also provide the services of specialists, librarians, who are experts at funding and organizing information and at interpreting information needs.” On the right is shown the bottom-up approach of Internet (Web 1.0) technologies such as search engines.

The convergence of these two approaches where librarians can provide assistance [3] “in navigating and analyzing tremendous amounts of knowledge with a variety of digital tools” is the theme of this paper.

Instead of conceptual approach [4] with formal definitions and analysis, we will take an example driven approach. The rest of the paper is organized as follows. In the next section, we use an example search for information about Bharatanatyam to illustrate the different aspects of emerging Web 2.0 technologies. We then give examples of useful services that could be incorporated in a science and technology library such the one at IIT Bombay using Web 2.0 technologies. We conclude the paper with a look at some of the concerns such as privacy and need for “radical trust” that need to be addressed during the evolution of libraries to their 2.0 version.

2. Information Access in Web 2.0 Era

Let us consider the options available today to a student who wishes to learn about Bharatanatyam. For various good reasons, a physical visit to her college library is probably the last option he/she would choose.

Figure 2 consists of two screenshots illustrating different search methods for the term 'bharatanatyam'.

(a) Direct Search: A Google search interface showing the search results for 'bharatanatyam'. The top result is the Wikipedia page, followed by other relevant links like 'Bharata Natyam - www.artindia.net' and 'Bharatanatyam - History of Bharatanatyam'.

(b) Faceted Search: A Grokker search interface showing the search results for 'bharatanatyam'. The results are categorized into various facets, such as 'Classical Dance (33)', 'Bharata Natyam (31)', 'Indian Dance (19)', 'General (16)', 'Dancer (14)', 'Dances of India (14)', 'Classical Dance (13)', 'Bharata Natyam (7)', 'Bharatanatyam Dancer (11)', and 'Bharatanatyam Performances (7)'. The 'Dances of India' facet is expanded, showing sub-categories like 'Classical Dance (13)', 'Bharata Natyam (7)', 'Bharatanatyam Dancer (11)', and 'Bharatanatyam Performances (7)'. The 'Dancer' facet is also expanded, showing sub-categories like 'Dance (7)', 'Movements (7)', 'Dance Company (6)', 'Hindu Sage (6)', 'Natyashastra (6)', 'Pandanallur Style (6)', 'Performing Arts (6)', 'Tanjore or Thanjavur (6)', 'Violin and Veena (6)', 'Ancient (5)', and 'Carnatic Music (5)'.

(a) Direct Search

(b) Faceted Search

Figure 2. Searching for Information

A Google search (see Figure 2(a)) would probably be her first bet. Google funds about half a million hits for this query. Trying to find useful information like this does seem like trying to “drink water from a fire hose.” However, Google uses a clever page ranking algorithm to put pages that it thinks are most useful at the top. For most such searches, the corresponding Wikipedia page usually comes near the top. Google’s page ranking is a simple illustration of how the “wisdom of the crowds” (one of the Web 2.0 mantras) can be tapped to good effect.

In contrast to the results of the direct search through Google, consider the faceted search [8] view offered by a service like <http://www.grokker.com>. This adds much more value to the results by grouping them under different (user contributed) tags (another Web 2.0 mantra). The user can now explore along various facets such as classical dances of India, composers, music, different schools and styles. For librarian this is like a faceted classification system which allows the assignment of multiple classifications to an object, enabling the classifications to be ordered in multiple ways, rather than in a single, pre-determined, taxonomic order. The Colon classification developed by S. R. Ranganathan is a very good example.

Multimedia content is particularly relevant for this search. Figure 3(a) shows the results from the popular <http://www.youtube.com>. A couple of Web 2.0 mantras are illustrated here. First is the open

Figure 3 consists of two screenshots illustrating search results for 'bharatanatyam'.

(a) YouTube search results for 'bharatanatyam'. The page shows a search bar with 'bharatanatyam' entered. Below the search bar, there are tabs for 'Videos', 'Channels', and 'Playlists'. The 'Videos' tab is selected, showing a list of video results. The top result is 'H1-Authentic (real) Bharatanatyam' by Arangtram, with a rating of 5 stars and 363,173 views. Below the video list, there are several playlist results for 'bharatanatyam', including 'Bharatanatyam' (614 views), 'Favourites - Bharatanatyam' (136 views), and 'Bharatanatyam' (85,288 views).

(b) WorldCat search results for 'bharatanatyam'. The page shows a search bar with 'bharatanatyam' entered. Below the search bar, there are tabs for 'Home', 'Search', and 'Create lists, bibliograph'. The 'Search' tab is selected, showing a list of search results. The top result is 'Bharatanatyam' by Prithvi, Prathibha, with a rating of 5 stars and 363,173 views. Below the search results, there are several filters and options, including 'Refine Your Search', 'Format', and 'Year'.

Figure 3. Integrated Searching

access publishing allowing anyone to make material accessible worldwide. Another is the architecture of participation brought out by the ratings given by others who have viewed this material. Usage statistics (how many people have viewed/downloaded) also offers useful clues in the search results.

Figure 3(b) is the result of searching the ambitiously named World Catalog at <http://www.worldcat.org/>. The takeaways from this in terms of Web 2.0 principles are service aggregation and mashups. Results from the World Catalog can be integrated into other web sites through program APIs. [1]

The examples above illustrate some of the features of Web 2.0 defined initially by O'Reilly [6] as follows.

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it,

consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an architecture of participation, and going beyond the page metaphor of Web 1.0 to deliver rich user experiences.

For a more detailed explanation with other illustrative examples a good starting point is again the Wikipedia page [5].

3. Library 2.0

The redefinition of the library's role is driven not only by the rapidly evolving Web 2.0 technologies, but also by the changing needs and demands of the next generation (Internet generation) users. Preparing a Know your User pamphlet (as opposed to the Know your Library ones) may be a very useful and educative experience for any Library with surprising results. It may be useful to remind ourselves of the (apocryphal) quote attributed to Mahatma Gandhi.

A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption in our work. He is the purpose of it. He is not an outsider in our business. He is part of it. We are not doing him a favor by serving him. He is doing us a favor by giving us an opportunity to do so.

There are various definitions of the term Library 2.0 [7]

The term "Library 2.0" was coined by Michael Casey on his blog LibraryCrunch as a direct spin-off of the terms Business 2.0 and Web 2.0. Casey suggested that libraries, especially public libraries, are at a crossroads where many of the elements of Web 2.0 have applicable value within the library community, both in technology-driven services and in non-technology based services. In particular, he described the need for libraries to adopt a strategy for constant change while promoting a participatory role for library users. Library 2.0 is the natural evolution of library services to a level where the library user is in control of how and when she gets access to the services she needs and wants. –Thomas Brevik, Library 1.5 .

The following is an indicative list of services that libraries could implement using Web 2.0 technologies.

◆ Customizable Alerts via Email/SMS Instead of static content which is same for everyone and hence more likely to be considered as spam, users may use the library site to subscribe to customized alerts. Examples of this include the following.

■ Be notified whenever a new book is acquired which matches user selected search criteria on author, title, keywords.

■ Be notified whenever a paper authored by a colleague (from the same or other departments/institutions) appears in a journals or conference proceedings online.

■ Get an email a day prior to and an SMS an hour before any seminar on campus whose title/topic contains some user defined keywords.

A little thought will reveal that each of these need some experimentation and integration of various Web 2.0 tools to implement. This in itself could be very interesting student projects that library staff could give out to technically competent students.

◆ User Ratings/Reviews/Discussions Most catalog search results only throw up static information (details about the book) and the only dynamic information is usually whether the book has been issued or is in the stacks. It would be very useful if the OPAC search allows users to view/edit some part of the result which includes their ratings of the book, comments on the content and discussions about related material. This will enable the useful flow of information between local users of the library and will encourage them to use this resource (over google or worldcat).

◆ Streaming/Podcasting and Archival of Seminars Most campuses with libraries often host very interesting seminars by distinguished visitors. The Library can play a very useful role of local content generation if it sets up services to stream the audio/video of the seminars and do further value addition of archiving the sites and updating the seminar content with discussions, comments, and question/answers. This will add great value to the institution making it increasingly a producer rather than merely a consumer of useful information.

4. Conclusion

As we have seen, a radical paradigm shift is happening in the role of Libraries in the current Information era. To stay relevant and remain useful Libraries have to adapt to

changing user requirements and expectations. Web 2.0 technologies can provide very useful tools in this evolution. But, it must be recognized that technology is only a tool and it should only be used once the higher level goals and functionalities are accepted as necessary by both the Library and the users. Once this happens, the best evolutionary path should be carefully chosen instead of trying to achieve an entire technology revamp which could prove both costly and counter-productive.

A bottom-up approach integrating and implementing one useful functionality at a time (even if not fully automated using Web 2.0 technologies) may prove more beneficial especially in the Indian context. The problems and risks involved in implementing user-driven services should also be analyzed a priori and systems should be designed taking these into account. Some major issues are security (much easier for crackers to break in when many interactive services are enabled), privacy (allowing users to retain control over how much of their personal information is revealed in the new services) and misuse such as spam and hate speech that some users may generate using the new services.

References

1. Wikipedia contributors, Information explosion, Wikipedia, The Free Encyclopedia, http://en.wikipedia.org/w/index.php?title=Information_explosion&oldid=234713017 (accessed January 16, 2009).
2. **Lyman, Peter and Hal R. Varian**, How Much Information, 2003. Retrieved from <http://www.sims.berkeley.edu/how-much-info-2003> on Jan 16, 2009.
3. Wikipedia contributors, Library, Wikipedia, The Free Encyclopedia, <http://en.wikipedia.org/w/index.php?title=Library&oldid=264211441> (accessed January 16, 2009).
4. **Maness, J.** Library 2.0 Theory: Web 2.0 and Its Implications for Libraries. *Webology*, 3 (2), 2006, Article 25. Available at: <http://www.webology.ir/2006/v3n2/a25.html>
5. Wikipedia contributors, Web 2.0 [Internet], Wikipedia, The Free Encyclopedia, http://en.wikipedia.org/w/index.php?title=Web_2.0&oldid=264085491 (accessed January 16, 2009).

6. **Tim O'Reilly** What Is Web 2.0 O'Reilly Network. Available at: [http : / / www . oreillynet . com / pub / a / oreilly / tim / news / 2005 / 09 / 30 / what-is-web-20 . html](http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html)
7. Wikipedia contributors, Library 2.0, Wikipedia, The Free Encyclopedia, [http : / / en . wikipedia . org / w / index . php ? title = Library _ 2 . 0&oldid = 260597356](http://en.wikipedia.org/w/index.php?title=Library_2.0&oldid=260597356) (accessed January 16, 2009).
8. Wikipedia contributors, Faceted search, Wikipedia, The Free Encyclopedia, [http : / / en . wikipedia . org / w / index . php ? title = Faceted _ search&oldid = 261023553](http://en.wikipedia.org/w/index.php?title=Faceted_search&oldid=261023553) (accessed January 16, 2009).

About Author

Prof. G Sivakumar, Professor at Computer Science and Engineering Department, IIT Mumbai.