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WEB 2.0 TECHNOLOGIES: BUILDING THE NEW WEB-BASED LIBRARIES

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Abstract: *This paper discusses and highlights the potential of Web 2.0 in the context of libraries. Internet in general and Web in particular are playing a vital role in computer-mediated scholarly communication. The objective of this study is to identify the purpose, characteristics, support system in research and changing environment as a result of using Web 2.0 technologies and tools. The findings of the study acknowledge the strength of Web 2.0 tools in improving library services for users. Really Simple Syndication (RSS), Instant Messaging (IM) and Blogs are popular in web-based libraries. The paper concludes by offering best practices for implementing Web 2.0 tools for new web-based libraries. Thus, these emerging web-based features (Web 2.0) are opening up new avenues and giving libraries the ability to offer the improved, customer-driven services to the user communities.*

Keywords: *Web 2.0, Technology, Web-Based, Social Networking, Internet.*

Introduction

The term Web 2.0 was coined in 1999 by Darcy DiNucci in her article. Its rise and popularity began in 2004, when O'Reilly Media and MediaLive organized the first Web 2.0 conference. The concept of Web 2.0 was crystallized from the process of measuring the reasons for success of some Internet companies in comparison with their competitors (O'Reilly, 2005b).

Berners-Lee, T. et al. (1999) vision of the World Wide Web was for a tool which created and gathered knowledge through human interaction and collaboration. Web 2.0 is a stage of development in which the Web is progressing towards this goal. Most analysts define Web 2.0 in terms of the tools that foster online participation in content creation and social interaction. This tends only to produce lists of new software applications or claims of 'we are the web', 'web 2.0 is people' etc. (Kevin Kell).

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John Battelle and Tim O'Reilly identified the 'Web as Platform' where software applications are building upon the web as opposed to upon the desktop. Web 2.0 refers to the development of online services that encourage collaboration, communication and information sharing. It reflects changes in how to use the web rather than describing any technical or structural change. According to Miller (2005), "Web 2.0 applications work for the user, and are able to locate and assemble content that meets our needs as users, rather than forcing us to conform to the paths laid out for us by content owners or their intermediaries."

The term "Web 2.0" refers to the second generation development and design of the web that aims to facilitate communication and to secure information sharing, interoperability and user centered design. Web 2.0 concepts have led to the development and evolution of web-based communities, hosted services, and applications, such as social-networking sites, video-sharing sites, Wikis, blogs, and folksonomies (King & Brown, 2009; Wikipedia, 2010c).

Web 2.0 tools facilitate sharing, networking and disseminating information among users and other professional groups.

Web 2.0 technologies are all set to change the way users interact with the resources and services available in the Web. Since the early days of Web, libraries are increasingly using it as a platform to disseminate services. Naturally, library professionals are closely observing this transformation of Web, and started addressing various issues related with this transformation, primarily in biblioblogsphere (Hanumat, 2010).

Library websites of universities are virtual presentation of the university libraries to the world and are considered as a window for providing its services to the users electronically even outside the library walls. They are library's virtual public face—the quasi equivalent of the front door, signage, pathfinders, collections or surrogates to the collections, services, and to an extent, its people (Pathak, Pal and Rai, 2008).

Statement of Problem
Web 2.0 tools are rapidly gaining popularity in all walks of life as they provide a space for online interaction and collaboration among users and are easy to use. Even in libraries, these tools have enabled the libraries to involve

users in their activities and solicit their feedback for improving the library services. Library websites are the windows through which services can be provided to users online. This means that users can access and make use of the resources in the library without physically visiting the library. Web 2.0 tools will help in enhancing these services provided online through library websites. It is assumed that many private university libraries including those in Bangladesh have already included a variety of Web 2.0 features in their websites but there is little research investigating the extent and purpose of the adoption of such features. The practices of the libraries of academic institutions in this regard should be explored to showcase the extent to which they use these technologies and the purpose of adoption of such technologies (P. Hangsing, 2012).

Objectives of the Study
The objectives of the present study are:

1. To identify web tools used by academic web-based libraries
2. To study the purpose of using these technologies
3. To examine the characteristics of the Web 2.0 tools used in academic libraries
4. To support system in research by using Web tools
5. To change the environment of the library services using web technologies

Significance of Web 2.0 Technologies in Libraries
Library users are becoming more dependent on web resources owing to its ease of use and anywhere or anytime accessibility. This is mainly due to the way the Information and Communication Technology (ICT) tools and services have influenced the library services. When a user is in need of information, the first thing that comes to mind is the web.
Earlier academic libraries were 'place-based' service providing institutions and users visited the library to consult the catalogue and use the physical collection of books, journals, CDs, etc. With the rapid changes in the field of information and communication technologies (ICT), library and information centers have been completely transformed. Web 2.0 tools have overcome the barriers to communication and the distance between the libraries and users (Stuart, 2010).

Web 2.0 applications encourage patrons to be an integral part of the virtual community by sharing their ideas, thoughts, feelings, and other content. They allow patrons to contribute to the maintenance of catalogues, review resources, locate and share relevant information with other patrons and society (Farkas, 2007). Now, patrons have become both consumers of and contributors to library services (Stephens, 2006).

The Web 2.0 tools have a pervasive impact on society. They allow users to create, describe, post, search, collaborate, share and communicate online content in various forms, ranging from music and bookmarks to photographs and documents (Macaskill & Owen, 2006); Virkus, 2008). The Horizon Report (2007) has highlighted that users can create content used for providing news, information and links to Internet resources for library users. The users find retrieving information from the Internet easier than visiting a library. The overwhelming success of Internet services indicates that libraries have to evolve and change to meet the needs of modern users. The application of Web 2.0 tools can easily help libraries to survive and flourish in the Internet age. Web 2.0 technologies have also significance in the following aspects (Hanumat, 2010):

a. *Powerful*: Web 2.0 technologies can be a powerful allure for an organization; their interactivity promises to bring more employees into daily contact to lower cost. When used effectively, they also may encourage participation in projects and idea sharing.

b. *Reduced Cost*: Using web 2.0 technologies, most often report greater ability to share ideas, improved access to knowledge experts and reduced costs of communications, travel and operations.

c. *Satisfaction*: The ability to forge closer ties has increased user awareness and consideration of user activities, resulting in improved user satisfaction.

d. *Easy Retrieval*: The users find retrieving information from the Internet easier than visiting a library. The overwhelming success of Internet services indicates that libraries have to evolve and change to meet the needs of modern users.

e. *Environment*: Web 2.0 is providing engines of change for academic library environment. These tools help library professionals organize their materials, enhance services for users and improve internal functions. The

application of these tools also increases demand for services in the virtual environment (Kajewski, 2007).

Use and Utility of Tools

1. To identify web tools used by academic libraries

Web 2.0 refers to the development of online services that encourage collaboration, communication and information sharing. Key technologies and social software tools that serve as the foundation of web 2.0 include the following:

Blogs: A blog is a type of website, usually maintained by an individual that contains regular entries of commentary, descriptions of events or other materials such as videos. King and Porter, 2007 suggested that blogs in academic libraries could be used for internal communication, to facilitate academic debate and to communicate with patrons, promoting new books and providing subject guides, current awareness and customized catalogue searches.

Wikis: A Wiki is a website, which facilitates the creation and editing of web pages using a simplified markup language. The first Wiki software was developed by Ward Cunningham. Libraries and academic institutions have been using Wikis for group learning, for sharing knowledge, experiences and open source products, and also to provide subject guides. Wikis have recently been adopted to support a variety of collaborative activities within libraries (Wikis, 2010c). Bejune (2007) emphasized the role of Wikis in libraries in extending collaboration activities: a) among libraries, b) among library staff, c) between library staff and patrons, and d) among users. The libraries can encourage patron contributions in the preparation of dictionaries, encyclopedias, books reviews and instructional resources.

RSS: Really simple syndication is a family of web formats used to publish information about frequently updated works, such as blog entries, news feeds, live audio, and video in the standard formats (Libby, 1999). Wusteman (2004) noted the important role of RSS in keeping users updated with the latest information. RSS feeds update users about the additions or changes which take place on websites of interest, providing information from one source instead of accessing individual websites.

Instant Messaging (IM): Instant messaging allows online communication between two or more people using text based short messages via the web in real time. Academic libraries use IM to provide virtual reference services, improve access of other services and provide the latest information to students (Stephens, 2006). Instant messaging also acts as an additional medium to facilitate interactions with patrons.

Podcasts and Vodcasts: The word podcast comes from the amalgamation of the words iPod and broadcast. This tool is used to exchange and share audio programs among patrons over the Internet. Podcasts are frequently used to broadcast speeches and interviews of important personalities. Libraries use podcasts mainly for offering tips, using the audio format.

Vodcasts: Vodcast mainly is used to deliver videos on demand to patrons over the web. The functioning features and limitations of vodcast are similar to those of podcast. The size of video programs is comparatively larger than the size of audio programs; therefore, vodcasts need high speed Internet connectivity. To reduce downloading time, vodcast video clips are typically three to five minutes in duration.

Social Bookmarking: These systems allow users to create lists of bookmarks or favorites, to store them centrally on a remote service, and to share them with other users of the system. By enabling this feature in digital libraries, users can create and share a set of resources with other users.

Social Networking: Web 2.0 is collaborative and interactive. Social networking services enable users to share information within a network of colleagues through user profiles, linking users to others posting similar information. A social network thus can be formalized into a net structure comprising nodes and edges. Nodes represent individuals or organizations. Edges connecting nodes are called ties, which represent the relationships between the individuals and organizations. (Aqil et al., 2011).

Multimedia Sharing: Web 2.0 technologies provide better access and sharing mechanisms for multimedia information. Podcasting is one among them which provides a different way to share the audiovisual material. Video on-line is another which facilitates the better video delivery to the user online. By using these technologies and services, digital library can disseminate multimedia information to its users in a better way.

2. To study the purpose of using these technologies

The Web 2.0 has tremendously changed the way of content creation and user access, use and contribution to information. Libraries are increasingly adopting Web 2.0 technologies to design services that allow them to reach users in the virtual space that they could not reach before. This allows librarians to target a segment of users in the population who will never visit the library to use their services, no matter how hard they try. A large part of this population belongs to the generation that grew up with Internet and they are often known as the digital natives. Web 2.0 tools have enabled libraries to create new services for the non-users of libraries that were not possible before.

As the communities change, libraries must not only change with them, they must allow users to change the library. It should constantly seek new ways to allow communities to seek, find and utilize information. Thus, there is a necessity to understand the concept of Library 2.0 and the opportunities it creates for libraries to provide content and services to their users.

With the spread of internet and its everyday use in society, the age classifications of users are becoming less important or even irrelevant (OCLC, 2007). The use of Web 2.0 features is far from being limited to younger generations and the differences between proficiency of users more and more seem to originate from the frequency and the complexity of use, rather than the mere date of birth. Web 2.0 usage is rising quickly among adults: in a number of applications, adult participation is significantly increasing while teen participation is decreasing in Comparison (Lenhart et al., 2010).

3. To examine the characteristics of the Web 2.0 tools used in academic libraries

Cobo and Pardo (2007) offered seven characteristic of Web 2.0 used in the academic web-based libraries.

- The web as the platform
- Harnessing the collective intelligence
- Managing database relevance
- Not more software versions
- Lighter programming
- Multi-devices orientation
- A semantic Moore's law

Anderson (2007) described six characteristics of web 2.0 used in the academic libraries.

- Individual production and user generated content
- Harness the power of the crowd
- Data on an epic scale
- Architecture of participation
- Network effects
- Openness

4. To support system in research using by Web tools

Web 2.0 refers to a second generation of web development and design that facilitates communication, secure information sharing, interoperability, and collaboration on the World Wide Web. Web tools along with a brief explanation of these tools support and enhance research (Mukhopadhyay, 2008).

SL#	Web 2.0 Tools	Functionality
01.	BibMe	• Create fast and easy bibliographies
02.	Bubbl.us	• Brainstorming made simple • Visual data • Flow charts
03.	CiteULike	• Easily store references and find online • Discover new articles and resources • Automated article recommendations • Share references with peers • Find out who's reading what are reading • Store and search pdf format
04.	Confolio	• Store files, links, ideas • Collaborate with others by sharing info • Publish opinions on contributions of others
05.	Connotea	• Save and organize links to references • Easily share references with colleagues • Access references from any computer
06.	Gapminder	• Interactive, dynamic data visuals • Trend analysis • Statistical analysis
07.	Google Docs	• Co-construction and online creation

		• Manuscripts, interview transcripts, spreadsheets. Presentations etc.
08.	Mendeley	• Sharing, building online research libraries • Collaboration
09.	Mindmeister	• Mindmaps • Schematic diagrams
10.	Zotero	• Bibliographic plug-in for organizing research

5. To change the environment of library services using Web 2.0 tools

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. Web 2.0 tools are most used in the library for providing web services, change and make a serene environment for the users (Maness, 2006).

1. **Penzu** (http://www.penzu.com): It is a simple online tool for creating a personal journal. Entries are automatically dated and students can add titles and text as well as images which appear in the margin of the page. They need to register to save their entries but this is quick and simple and only requires an email address.

2. **Voxopop** (http://www.voxopop.com//): Voxopop is a web-based audio tool that enables users to record their speaking for others to listen and respond to. It allows teachers and students to build up threaded audio discussions online similar to those on a text based bulletin board.

3. **Listen and Write** (http://www.listen-and-write.com/): Listen and write is a dictation exercise creation tool. It has a large number of dictation exercises already created in a number of languages, but students can also create their own.

4. **Dvolver Moviemaker (**http://www.dfilm.com/live/mm.html): Dvolver Moviemaker is a simple tool that enables to create own animated cartoons by selecting from a range of characters backgrounds and scenarios and adding own dialogue text bubble. The movies can then be sent by email or embedded into blogs or websites for others to enjoy.

5. **280 Slides** (http://280slides.com/): 280 Slides is a web-based presentation tool similar to PowerPoint. It enables to create presentations with a series

of slides and embed rich web based media into the slides such as video, audio and images.

6. **Eyeplorer** (http://eyeplorer.com/show/): Eyeplorer is a research and study tool built around Wikipedia. It enables students to search and cross reference terms in order to find and collate notes and references in preparation for writing assignments.

7. **Wordle** (http://www.wordle.net/create): Wordle is a simple tool that enables to create colorful graphic representations of texts based on word occurrence from any given text.

8. **TokBox** (http://www.tokbox.com/): TokBox is a free video communication platform that works in the browser without requiring download of any additional software. It enables a number of modes of communications.

9. **Forvo** (http://forvo.com/): Forvo is a multilingual user generated pronunciation dictionary. It can search and find the pronunciation of words from a vast range of languages.

10. **ESL Video** (http://www.eslvideo.com/index.php): ESL Video is a site that enables to create web-based interactive quizzes based around online videos. It can create a variety of multiple choice type questions, add transcripts or translations, and add notes, etc.

Web 2.0 is totally a technological modern concept. It enhances the working culture and willingness to communicate openly in virtual network. User participation is the key to the successful implementation of social software perception in the virtual world. Therefore, library should take the challenges to stand as good social partner in the online collaborative environment. The subsequent challenges should be tackled well while implementing social software in library.

The potentiality and credibility of librarian is a question mark in the age of information landscape where technology is changing drastically. The ongoing debate centers on the role of libraries, sometimes seen as 'inefficient, limited and obsolete' (Crawford, 2006). Libraries and librarians are important but they need to change. The geometric increase in the quantity and quality of information, greater access, easy and quick retrieval of information are most crucial issues in the scenario of knowledge sharing and management. Also virtual presence of libraries remains as a issue of great debate for future.

Conclusion

Web 2.0 technologies are all set to change the way users interact with the resources and services available in the web. In summary, the Web 2.0 areas of rich content and community are being used successfully by organizations today, both internally for knowledge capture and reuse, and externally for creating communities of customers. While most of the interest today is in the knowledge capture and reuse, there are still significant cultural and social issues to the successful implementation of these systems which are not solved by Web 2.0 techniques. The less well-explored area of the use of customer communities has much greater promise to the organization, yet comes with its own concomitant risks around IP and vandalism which have to be addressed.

The librarians' authority and domain will be opened to a larger section of the user community and will actively participate in the various library functions and services. A lot of libraries have already adopted and implemented the Web 2.0 tools, especially in the developed countries, but the third world nations are lagging behind in adopting and implementing the Web 2.0 tools mostly because of their restricted budget and other problems. Finally, it is also necessary to consider that the web will continue to develop and Web 2.0 is just the beginning of one of many changes occurring in the web world, so librarians and information managers must welcome and adopt this modern technological-based concept in libraries as they did with the web originally.

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