

Adoption of Web 2.0 Applications in Academic Libraries in India

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ABSTRACT

The adoption of Web 2.0 tools in academic libraries in India, the barriers and motivating factor to its use is investigated. The study involved an exploratory survey of the contents of the academic library websites in India. The websites of 28 Central Universities, 16 Indian Institutes of Technology (IITs) and 13 Indian Institutes of Management (IIMs) were identified for the study. A structured questionnaire was mailed to library professionals from selected Universities and Institutes in India. The findings suggest that the library professionals are favourably inclined towards the use of Web 2.0 applications in libraries. The major barriers perceived include accessibility of the internet by users, lack of incentives, institutional support, technical support, training, and resources. Personal interest in using technology, proper training and technical support were found to be the major motivating factors.

Keywords: Web 2.0 tools, academic libraries, india, barriers, motivators

1. INTRODUCTION

The academic libraries play a key role in disseminating knowledge by aiding in the teaching, learning and research activities of the higher education institutions. The library and information services are going through a transition in the new age society. The technological developments have transformed the way people access and consume information. In response to the changing information landscape, libraries are making efforts to meet the diversifying needs and growing expectations of the users by adopting new technology and tools. Web 2.0 is dynamic, participatory, and user-oriented. As mentioned by Bachrach¹, 'for academic libraries' purposes, Web 2.0 offers a new and fairly easy way to connect with patrons, promote our libraries, and offer our services in a convenient context'. The academic libraries in India can effectively use these tools to reach out to the users and provide better services to them. The paper presents the findings of a study about the adoption and use of Web 2.0 tools in academic libraries in India. The study was undertaken to explore the challenges to the use of Web 2.0 tools and applications in Indian libraries and to gain useful insights into promotion and use of Web 2.0 tools among library professionals in India.

2. LITERATURE REVIEW

2.1. Web 2.0: An Overview

There is no single definition for Web 2.0, but the term is used to describe the second generation of the World Wide Web which is characterised by user generated and dynamic content, online collaboration and sharing among users. In the words of O'Reilly², '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.' As mentioned by Chua & Goh³, Web 2.0 represents 'an emerging suite of applications that hold immense potential in enriching communication, enabling collaboration and fostering innovation'. Web 2.0 includes technologies such as 'web-based communities, hosted services, and applications, such as social-networking sites, video-sharing sites, Wikis, blogs, and folksonomies'⁴.

2.2. Adoption of Web 2.0 Tools in Libraries

Web 2.0 tools have been widely recognised as an effective mechanism of interactivity and communication. Kroski⁵ discussed the use of Web 2.0 tools for improved library services. It is opined that new technologies will increase user participation and facilitate the libraries to provide better services to existing users, reach out to prospective users and ensure optimum use of available resources⁶.

Recent research shows that Web 2.0 technologies are being adopted in libraries world over for serving the patrons better. For instance, in a study of the websites of 120 libraries from North America, Europe & Asia, Chua & Goh³ found a correlation between the presence of Web 2.0 applications and the quality of library websites. In a similar study, Mahmood & Richardson⁷ surveyed 67 US academic libraries and found that some form of Web 2.0 technology was being used in the library. However, a closer look at some other studies conducted (by Han & Liu⁸; Harinarayana & Raju⁹ and Kim & Abbas¹⁰) on the use of Web 2.0 technologies indicates the adoption of web tools to be slower than expected. Linh¹¹, in a survey of Australasian university libraries, found that Web 2.0 technologies such as RSS, Blogs, IM and podcasts were being used with some basic features in only two-thirds of the surveyed libraries. The status of the use of Web 2.0

applications in Chinese Universities was reported to be in basic development stage by Han and Liu⁸. In a study of top 38 Chinese university libraries they found that most of the libraries were using only one or two applications. Xu, Ouyang & Chu¹² analysed the websites of academic libraries in New York and reported that only half of the surveyed 81 libraries adopted a Web 2.0 tool, with IM being the most adopted tool followed by blogs and RSS. A number of studies related to the university libraries across the world indicated applications such as RSS, IM and blogs to be most applied features (Tripathi & Kumar⁴; Harinarayana & Raju⁹; Kim & Abbas¹⁰). Boateng and Liu¹³ present an exploratory study of the top 100 US academic libraries. They found SNS, followed by blog, RSS and IM most widely used tools, with all the libraries having a presence on Facebook and Twitter.

2.3. Barriers to the Use of Web 2.0 Tools

There are different barriers and the challenges related to the adoption and use of Web 2.0 tools in libraries. According to Kelly¹⁴, *et al.* barriers to effective use of Web 2.0 tools include sustainability risks, digital preservation risks, user disinterest, and accessibility issues. They also highlight the need to raise awareness and willingness to use these services to ensure success in providing enhanced service to the user. Chawner¹⁵ in a survey of LIS professionals in New Zealand categorised the various barriers as institutional barriers (such as firewalls, limited access to services), personal barriers (lack of time, interest and skills) and technological barriers (lack of broadband access). She also identified some other barriers such as quality of information, privacy and security issues, changing information needs, and lack of staff training. Cao¹⁶ mentioned management buy-in, lack of awareness, lack of user participation, and lack of technology staff as some of the issues related to the use of Web 2.0 in Chinese libraries and stressed on the need for systematic training. Owasu-Ansah¹⁷ in a study on Web 2.0 use in select African institutions highlighted the need for social media strategy, appointment of social media librarians, and continuing professional development of librarians to enable effective use of emerging technologies in academic institutions. Byrne¹⁸ provides useful insights into the legal and ethical issues related to the user-generated content when Web 2.0 tools are used in libraries. Some other barriers include lack of privacy¹⁹, lack of necessary skills²⁰, and doubts about the reliability of tools²¹, and lack of institutional support²² and lack of policy on emerging technologies²³.

The review of literature shows that there is a dearth of research on the adoption of Web 2.0 technologies in Indian academic libraries. There is a strong need to explore the related aspects such as barriers and motivators to the use of Web 2.0 tools in academic libraries in India. Therefore, to fill the gap in literature, the present study attempts to examine the extent to which Web 2.0 tools and technologies have been adopted in Indian academic libraries and the related barriers and motivators.

3. OBJECTIVES

The objectives of the study were to:

- (a) Identify the adoption and use of various Web 2.0 tools and technologies in academic libraries in India
- (b) Investigate the familiarity and use of Web 2.0 tools by the library science professionals in India
- (c) Identify the perceived barriers and motivators to the use of Web 2.0 tools in academic libraries.

4. METHODOLOGY

Initially a preliminary and exploratory study of the library websites of all the academic libraries in India was conducted. Only those university libraries which have a proper library website were considered for the study. The websites of 58 university libraries (which included 28 Central Universities, 16 Indian Institutes of Technology (IITs) and 13 Indian Institutes of Management (IIMs)) were identified and analysed further to identify the presence and use of the Web 2.0 features.

This was followed by a questionnaire based survey to investigate the use of Web 2.0 tools, and the perceived barriers and motivators of the library professionals in the selected libraries towards the use of Web 2.0 tools. The survey questionnaire had items on demographics, familiarity, barriers and motivators towards the use of Web 2.0 tools by library professionals in academic libraries in India. The questionnaire was administered to a sample of 120 library and information professionals randomly selected from 58 academic libraries in India. The questionnaire was administered online through the personalised e-mail. A few reminders were also sent. The responses thus collected were analysed and interpreted. The findings of the study are discussed in the following sections.

5. FINDINGS AND ANALYSIS

The results from the survey are discussed in five sections: use in select Indian academic libraries, demographics, level of use and familiarity, barriers and motivators.

5.1. Use of Web 2.0 Technologies in Select Indian Academic Libraries

As shown in Table 1 among the 58 academic institutions, 22(34%) of them were using Web 2.0 tools to support services to the users. The findings of the preliminary study suggest that:

- (a) Web 2.0 technologies being used include Blog, Video sharing, Mashups, Social networking, RSS and IM
- (b) Blog is the most commonly used technology while IM is the least used one
- (c) The libraries are still at the early stage of Web 2.0 development

Table 1. Use of Web 2.0 Technologies in Select Indian Academic Libraries

S. No.	Libraries of selected Academic Institutes	IM	WiKi	Blog	News feeds/ RSS	Social book marking	Podcast /vodcast	Face book	Photo sharing	Video sharing	Social cataloguing	Mash ups
1.	IIT Kharagpur	1	0	0	0	0	0	0	0	0	0	0
2.	IIT Mumbai	0	0	1	1	0	0	1	0	1	0	0
3.	IIT Madras	0	0	0	0	0	0	0	0	0	0	0
4.	IIT Kanpur	0	0	0	0	0	0	0	0	0	0	0
5.	IIT Delhi	0	0	0	0	0	0	0	1	1	0	0
6.	IIT Guwahati	0	0	0	0	0	0	0	0	0	0	1
7.	IIT Roorkee	0	0	0	0	0	0	0	0	0	0	0
8.	IIT Hyderabad	1	0	1	1	0	0	1	0	0	0	0
9.	IIT Patna	0	0	0	0	0	0	0	0	0	0	1
10.	IIT Gandhinagar	0	0	0	0	0	0	0	0	0	0	0
11.	IIT Bhubaneswar	0	0	0	0	0	0	0	0	0	0	0
12.	IIT Ropar	0	0	0	0	0	0	0	0	0	0	0
13.	IIT Jodhpur	0	0	1	0	0	0	0	0	0	0	0
14.	IIT Indore	0	0	1	0	0	0	0	0	0	0	1
15.	IIT Mandi	0	0	1	0	0	0	0	0	0	0	0
16.	IIT BHU	0	0	0	0	0	0	0	0	0	0	0
17.	IIM Calcutta	0	0	0	0	0	0	0	0	0	0	0
18.	IIM Ahmedabad	0	0	1	0	0	0	1	0	0	0	0
19.	IIM Bangalore	0	0	0	0	0	0	0	0	0	0	0
20.	IIM Lucknow	0	0	0	0	0	0	0	0	0	0	0
21.	IIM Kozhikode	0	0	0	0	0	0	0	0	0	0	0
22.	IIM Indore	0	0	0	0	0	0	1	0	1	0	0
23.	IIM Shillong	0	0	0	0	0	0	0	0	0	0	0
24.	IIM Rohtak	0	0	0	0	0	0	0	0	0	0	0
25.	IIM Ranchi	0	0	0	0	0	0	0	0	0	0	0
26.	IIM Raipur	0	0	0	0	0	0	0	0	0	0	0
27.	IIM Tiruchirapalli	0	0	0	0	0	0	0	0	0	0	0
28.	IIM Udaipur	0	0	0	0	0	0	0	0	0	0	0
29.	IIM Kashipur	0	0	0	0	0	0	0	0	0	0	0
Libraries of Central Universities												
30.	Aligarh Muslim University	0	0	0	0	0	0	0	0	0	0	0
31.	University of Allahabad	0	0	0	0	0	0	0	0	0	0	0
32.	Assam University	0	0	1	0	0	0	0	0	0	0	0
33.	Babasaheb Bhimrao Ambedkar University	0	0	0	0	0	0	0	0	0	0	0
34.	Banaras Hindu University	0	0	0	0	0	0	0	0	0	0	0
35.	Central University of Himachal Pradesh	0	0	0	0	0	0	0	0	0	0	0
36.	Central University of Jharkhand	0	0	0	0	0	0	0	0	0	0	0
37.	Central University of Karnataka	0	0	0	0	0	0	0	0	0	0	0

S. No.	Libraries of the elect Academic Institutes	IM	WiKi	Blog	News feeds/ RSS	Social book marking	Podcast /vodcast	Face book	Photo sharing	Video sharing	Social catalogu- ing	Mash ups
38.	Central University of Kashmir	0	0	0	0	0	0	0	0	0	0	0
39.	Central University of Kerala	0	0	1	0	0	0	0	0	0	0	0
40.	Central University of Orissa	0	0	0	0	0	0	0	0	0	0	0
41.	Central University of Rajasthan	0	0	0	0	0	0	0	0	1	0	0
42.	Central University of Bihar	0	0	0	0	0	0	0	0	0	0	0
43.	Dr. Hari Singh Gour University	0	0	0	0	0	0	0	0	0	0	0
44.	Indira Gandhi National Open University	0	0	0	0	0	0	0	0	1	0	0
45.	Jamia Millia Islamia	0	0	0	0	0	0	0	0	0	0	0
46.	Jawaharlal Nehru University	0	0	0	0	0	0	0	0	0	0	0
47.	Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalaya	0	0	0	1	0	0	0	0	0	0	0
48.	Manipur University	0	0	0	0	0	0	0	0	0	0	0
49.	Mizoram University	0	0	0	0	0	0	0	0	0	0	0
50.	Nagaland University	0	0	0	0	0	0	0	0	0	0	0
51.	North Eastern Hill University	0	0	0	0	0	0	0	0	0	0	0
52.	Pondicherry University	0	0	0	0	0	0	0	0	0	0	1
53.	Sikkim University	0	0	0	0	0	0	0	0	0	0	0
54.	Tezpur University	0	0	0	0	0	0	0	0	0	0	0
55.	University of Delhi	1	0	0	0	0	0	0	0	1	0	0
56.	University of Hyderabad	0	0	0	0	0	0	0	0	0	0	0
57.	Nalanda University	0	0	0	0	0	0	1	0	0	0	1
58.	South Asian University, Delhi	0	0	0	0	1	0	1	0	1	0	0

(d) Web 2.0 tools such as wiki, social cataloguing, social bookmarking, podcasting are not used in any of the library websites considered for the study

(e) The use of Web 2.0 features in in libraries of IITs and IIMs, which are premier education institutes in India, is modest

(f) The use of Web 2.0 features is found to be very less in Central University libraries.

It is also derived from the findings of the study that the use of Web 2.0 tools in Indian academic libraries is very low. This is surprising result considering the popularity of the Web 2.0 tools in India.

Blog: The study found that blogs are the most common Web 2.0 utility in the academic library websites with 8(3.79%)

libraries having a blog to connect with the users. Blogs are used for announcements of library services and events and to provide information about new books, articles of interest and databases acquired by the library.

Instant Messaging (IM): The study revealed that Instant Messaging (IM) is used only by 2 (23.44%) academic libraries. These are libraries of IIT Kharagpur and IIT Hyderabad, which use a Chat widget for connecting with the users. A majority of the surveyed libraries provide asynchronous reference service in the form of a web page named 'Ask a Librarian' with a small form or text box where the user can submit his query, feedback or suggestions.

RSS: The study found that 3 (5.17%) library websites considered for the study use RSS. These are libraries of IIM Ahmedabad, IIT Hyderabad and IIT Mumbai.

Facebook and Twitter: The study found that only 3 (5.17%) academic libraries have presence on social websites such as Facebook and Twitter. These are libraries of IIM Ahmedabad, IIT Hyderabad and IIT Mumbai.

Video sharing: Video sharing is the second most commonly used Web 2.0 feature. The study found that Video sharing feature is used by 7 (12.06%) libraries.

Mashups: The present study found Mashup is the third most commonly used Web 2.0 feature. Mashups are deployed by 6 (10.34%) academic libraries. IIT Kharagpur uses mashup in the form of campus map. It also provides virtual tour of the library through photos. IIT Patna, IIT Guwahati and IIT Indore use mashups of map for providing location information.

5.2. Participant Demographics

Questionnaires were administered to select 120 library professionals. Total 80 responses out of 120 were received, thus representing a response rate of 66.67%. Out of the 80 respondents, 72.50% (n=58) of the respondents were males and 27.50% (n=22) were females; 12.50% (n=10) of the respondents were Librarians, 20% (n=16) were Deputy Librarians, 32.50% (n=25) were Assistant Librarians, and 35% (n=28) were Technical or Professional Assistants.

5.3. Familiarity and Use of Web 2.0 Tools and Technologies

The respondents were asked if they were aware about the Web 2.0 tools and technologies. All the responses were in affirmative. The respondents were asked about the Web 2.0 tools and technologies used, to understand the level of familiarity. As shown in Fig. 1, it was found that majority of the information professionals were familiar with Facebook (86.25%, n=69), followed by Wikipedia (85.00%, n=68), YouTube (80.00%, n=64), and Blogs (78.75%, n=62). On the other hand, only 25.00% (n=20) indicated to have used Social Bookmarking and 12.50% (n=10) Mashups. When asked if the Web 2.0 should be used in academic libraries, all the respondents replied in positive. This shows a favorable inclination

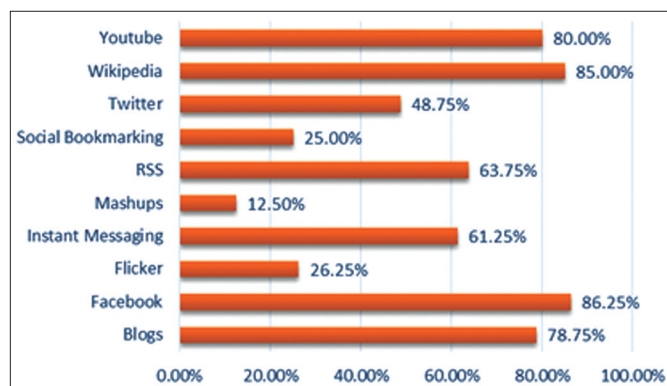


Figure 1. Web 2.0 tools used by the Information Professionals.

among the library professionals towards the use of Web 2.0 tools in libraries.

5.4. Frequency of Use at Work

An attempt was made to assess the frequency of use of Web 2.0 tools at work by the library professionals for providing information services to the patrons. As shown in Table 2, 42.50% (n=34) respondents indicated using it sometimes followed by 33.75% (n=27) using it very frequently. 3.75% (n=3) respondents reported rarely using it, with the same number indicating never having used it. The results highlight the strong need to encourage the use of Web 2.0 tools in libraries.

Table 2. Frequency of use at work

Option	N (%)
Very frequently	27 (33.75)
Sometimes	34 (42.50)
Often	13 (16.25)
Rarely	3 (3.75)
Never	3 (3.75)

5.5. Barriers to the Use of Web 2.0 Tools

An attempt was made to investigate the problems and difficulties faced by the professionals in using Web 2.0 tools and technologies in academic libraries. The respondents were asked to list the most significant barriers from a list of 12 barrier statements. Table 3 shows the rank order, frequency, percentage and barrier strength of these barrier statements on a scale of 1 (strongly disagree) to 5 (strongly agree). The measure demonstrated good internal consistency with the Cronbach alpha coefficient of 0.90. The results indicate that the major barrier perceived by the library and information professionals was the accessibility of the Internet by students or users. This was followed by lack of incentives and concern about security of Web 2.0 applications. Lack of training, technical support, and time along with lack of resources (financial and infrastructural) were other identified barriers. Lack of technical skills and knowledge about Web 2.0 tools and technologies were at the bottom of the list of barriers.

5.6. Motivators to the Use of Web 2.0 Tools

The respondents were asked to identify and rate the motivating factors that influenced their use of Web 2.0 tools and technologies. They were provided a preselected list of 8 possible motivator statements. Table 4 summarises the rank, frequency, percentage, and the strength of the motivating factor, on a five-point scale of '1' (strongly disagree) to '5' strongly agree. The statements are listed in descending order from highest to lowest mean score and are ranked accordingly. The measure was found to have high internal consistency of about 0.88 (alpha).

As depicted by the results, personal interest in using latest available technology and desire to interact directly

Table 3. Barriers to the use of web 2.0 tools

Rank	Items	No. of Respondents (%)	Mean
1.	I am concerned about accessibility to students users	41 (60.29)	3.73
2.	There is a lack of incentives to use Web 2.0 tools	37 (54.41)	3.57
3.	I am concerned about security of Web 2.0 applications	39 (57.35)	3.51
4.	There is a lack of training on Web 2.0 tools and applications	36 (52.94)	3.40
5.	There is a lack of technical support for maintaining Web 2.0 applications	32 (47.06)	3.29
6.	I lack time to use Web2.0 tools to reach out to the users	32 (47.06)	3.28
7.	I find Web 2.0 tools are not valued by the decision makers in the institution	28 (41.18)	3.23
8.	There is a lack of financial resources to use Web 2.0 tools	28 (41.18)	3.00
9.	There is inadequate hardware and software in the library	25 (36.76)	2.84
10.	There is poor internet access and networking in library	20 (29.41)	2.55
11.	I lack technical skills to use web 2.0 tools	18 (26.47)	2.50
12.	I do not have much knowledge about Web 2.0 tools	16 (23.53)	2.40

Table 4. Motivating factors to the use of Web 2.0 tools

	No. of Respondents (%)	Mean
My personal interest in using latest available technology	75 (94.94)	4.27
I like to interact with the users directly through Web 2.0 tools	75 (94.94)	4.26
Provision for proper training on Web 2.0	68 (86.08)	4.07
Use of Web 2.0 tools is good for my professional development	66 (83.54)	4.02
The availability of proper technical support in the library for utilising Web 2.0 tools	66 (83.54)	3.97
Use of Web 2.0 will bring peer recognition and prestige	63 (79.75)	3.90
There exist strong personal incentives to use Web 2.0 tools	45 (56.96)	3.54

with the users were found to be the strongest motivating factors. Respondents also indicated proper training as one of the strong motivating factors at Rank 3. Peer recognition and prestige, and personal incentives to use Web 2.0 tools were considered least motivating with a mean score of 3.54.

6. DISCUSSION AND CONCLUSIONS

The present study highlights that the use of Web 2.0 technologies in libraries in India is marginal and in initial stages. The synchronisation of the library services to the Web 2.0 is a challenge for libraries. Serious efforts are required for use of these technologies which are freely and easily available. The libraries have begun to realise the importance of incorporating Web 2.0 features in their websites to increase interactivity, the focus must be on adopting new approaches to library services by integrating various Web 2.0 components.

The results of this study indicate that the accessibility of the internet by users, lack of incentives, institutional support, technical support, training, and resources are the significant barriers perceived by the library and information professionals. The information professionals were also found to be concerned about institutional support in terms of incentives, financial and infrastructural resources. It was found that both the intrinsic (such as personal interest and willingness) and extrinsic motivators (such as training and technical support) are crucial in the use of Web 2.0 by the information professionals.

The librarian has a key role to play by utilising the collaborative and interactive opportunities provided by the Web 2.0 technologies to build strong connections with their users and create deep user experiences. The present study stresses the need for training, technical support and better organisational support to promote the use of Web 2.0 tools and technologies in Indian libraries which are way behind the academic libraries in developed nations. There is also a strong need for establishment of necessary policies and practices for ensuring proper implementation of technology in the Indian library system.

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