September 2019

The Application of Web 2.0 Tools in University Libraries of India

Sandip S. Patel
Gujarat University Ahmedabad, sandiplib@gmail.com

Atul Bhatt
Gujarat University Ahmedabad, dratulbhatt@gmail.com

The Application of Web 2.0 Tools in University Libraries of India

Sandip S. Patel
Librarian,
Gujarat Arts & Science College,
Ahmedabad, India

Atul Bhatt
Associate Professor,
Department of Library & Information Science,
Gujarat University,
Ahmedabad, India

Abstract:

This research study aims to focus towards the application or evaluation of Web 2.0 tools in State University Libraries of India. The present study deals with the extent usage of Web 2.0 in State University Libraries of India.This research used content analysis based on quantitative and qualitative data which is collected by website observation and questionnaire method. Out of 348 Indian State University Libraries 69% of libraries are having official website and 31% of libraries are lacking any dedicated library webpage. It is found that 9.77% of the Indian State University Libraries were using Web 2.0 technologies to provide services to their users. It is found that the highest Web 2.0 application index is in state of Kerala. OPAC 2.0, Mashups, RSS, Social Bookmarking & Tagging, Social Networking Services, Vodcast and Blog are the most widely applied technology and YouTube, Google Docs, Instant Messaging, Wikis are the least used technology amongst respondent libraries.

Keywords: Web 2.0 tools, Social Media technology, Library 2.0, Web 2.0 application, Social media application, Social Networking Services

Introduction:

The emergence of ICT has made communication process dynamic,fast and reliable interaction across boundaries is now possible. According to Liu (2008) "Academic library websites are libraries virtual presentation to the world".(PEW Research Centre, 2017) observed that around seven-in-ten Americans use social media to connect with one another, engage with news content, share information and entertain themselves. In 2005 only 5% adults used social media platforms and today 69% of the public uses some type of social media. This improvement has made libraries around the globe to rethink their library services and quick to apply web 2.0 components for example Blog, RSS, Wikis, Bookmarking site, instant messaging (IM), and social networking sites like Facebook, and Myspace, etc., into their library to serve their patrons in effective way. Indian university libraries also started embracing the technology so that they may easily outreach their users. It is likely that none of the research is focused towards the application or evaluation

of Web 2.0 tools in State university libraries of India. Hence, the present study deals with the extent of usage of Web 2.0 in state university libraries of India.

Research Objectivesof the study:

1   To identify Web 2.0 technologies those are applied in Indian state university libraries.

2   To examine purposes of Web 2.0 uses in the libraries.

3   To investigate characteristic features of the use of Web 2.0 in the libraries.

4   To compare usage of Web 2.0 in state wise Indian state university.

5   To know whether some innovative information services are being provided using Web 2.0 tools.

Literature review:

(Linh, 2008) conducted a survey to present general picture of application of Web 2.0 technologies in Australian University Libraries (AULs). It was found that two thirds of AULs have deployed the Web 2.0 tools and only four tools namely RSS, blogs, instant messaging and podcasts are used for some specific purposes with basic features.(Kannikaparameshwari&Nikam, 2009) analyzed the utilization of Web 2.0 tools in selected Indian libraries like National Law schools, IIM's, IIT's. It was discovered that 25% of libraries deployed at least one Web 2.0 tools. Out of 28 Indian libraries, three libraries are utilizing Web 2.0 tools with application index of 34.8.(Tripathi& Kumar, 2010) examined that "Use of Web 2.0 tools in academic libraries: A reconnaissance of the international landscape" furthermore, they found that 211 libraries 76.2% had applied no less than one of the Web 2.0 technologies, while 66 of them 23.8% of libraries are lacking the Web 2.0 tools. (Han &Quan Liu, 2010) have conducted online survey of 38 top Chinese university libraries websites and discovered that more than two-thirds of the 38 top Chinese university libraries are having number of Web 2.0 tools through the essential functions of these internet sites. RSS are the most common, while IM, Blog, SNS and Wiki are less consistent.(Si, Shi, & Chen, 2011) preferred "top 30 Chinese university and looked into the use of Web 2.0 tools". It was discovered that Two-thirds of Chinese university libraries have deployed number of Web 2.0 tools. RSS was the most extensively applied, while Wiki was minimal.(Patel & Poluru, 2013) depicted that that there are very few university libraries in Gujarat that are applying Web 2.0 tools for different purposes and Eight technologies are employed by university libraries in Gujarat namely RSS, Blog, Instant Messaging, Facebook, Twitter, Google Docs, Podcasts, YouTube. It was found that RSS is the only tool that is being utilized at the maximum because of its functional simplicity whereas the other tools are least utilized.(Boateng&Quan Liu, 2014) explored in the article titled "web 2.0 technologies usage and trends in the top 100 US academic libraries through the academic library websites". They noticed that all 100 scholastic libraries had an online

networking available on Facebook and Twitter, making Social networking service the most generally adopted Web 2.0 technologies. The wiki was the minimum connected Web 2.0 tool. Blog was the second most famous web 2.0 applications with a 99% of interest rate, followed by RSS and IM/Chat with 97%and 91%of interest respectively. The Vodcast and Podcast had 47% and 46% of interest rates individually, while social bookmarking/tagging also utilized by 39% of the scholarly libraries.(Xu, Ouyang, & Chu, 2009) examined the websites of 81 scholarly library sites in the New York state and found that "42% of them applied at least one Web 2.0 tools, for example, blog while execution of those tools in individual libraries changes significantly".(Mahmood& Richardson, 2011) Surveyed web sites of100 member educational libraries of Association of Research Libraries (USA) and discovered that all libraries utilizing various tools of Web 2.0, Micro blogs, RSS, Personal blogs, Instant Messaging (IM), Mashups, Podcasts, Vodcasts and Social Networking sites were greatly implemented, photo sharing, while Wikis, presentation showing, virtual worlds, vertical search engines, personalized webpages and were used less. Librariansutilizing these tools for sharing media, marketing library services, to conduct information literacy programs and to provide user education, providing information about print and digital resources, and soliciting responses of users.Awele and Foluke (2019) studied the Web 2.0 applicationsblog, wiki, podcast and social network (Facebook) etc. used by the students and observed that most of students are familiar with Web 2.0 applications and are using for educational purposes.Jerome et.al.(2019) studied Web 2.0 application in LIS centres in developing countries and discussed few tools blog, RSS instant messaging and SNS they have suggested that policy should be framed for the purpose.

Research Methodology:

This research used content analysis which have used for the quantitative approach. Content analysis method has been applied to modern technologies such as web sites, television, radio, internet (Salinas, 2006). "Content analysis used to identify record the meaning of documents and other forms of communications in a systematic and quantitative way" (Allen & David, 1990). (Krippendorff, 2013) expressed that content analysis is content responsive, accepts unstructured material, can prepare representative structures, and can manage substantial amounts of data.

This study has been carried out from only State University Libraries of India and 348 Indian State University Libraries websites have been observed to examine adoption of Web 2.0 tools for providing easy and fast services to their Library users. Further, University libraries website have been analysedwhich have implemented Web 2.0 technology. During the study 34 state universities have implemented Web 2.0 tools so that these libraries are treated as final size of the sample for the present research.

- The study covers only those Indian state university libraries, whose websites are accessible through the Internet.
- The study covers only those Web 2.0 tools and technologies that are publicly available for study

Stages of the Study:

1   In the first stage (I), Prepared a list of University from UGC website (University Grants Commission, 2015) (Appendix-1)

2   In the second stage (II), observation in regard of Web 2.0 based services offered by the Indian state University Libraries have been using their Library websites/pages and prepared a list of university those are using Web 2.0 tools.

3   In the third stage (III), A structured online questionnaire/checkpoints has been prepared with the help of software Google document and circulated to the Indian state university libraries that are using web 2.0 tools.

4   In the fourth stage (IV), of this study is data analysis, presentation of research, compare usage of web 2.0 tools in state wise.

5   In the Fifth stage (V), is related to findings, suggestions and conclusion

Observation Method:

The data was collected by visiting the library websites. 348 Indian State University Libraries websites home page/subpages accessed and identified for implementation of Web 2.0 technologies sometimes, a direct hyperlink to Web 2.0 tools was not accessible on the home pages of the libraries; at that point the Google internet searcher used to find links to Web 2.0 tools on library sites.

Questionnaire/checklist method:

Questionnaires/Checklist Prepared based on the study of literature. There are no such standards tools available for evaluating application of Web 2.0 in the library and the reality that Web 2.0 is a group of different technologies. Based on (Tripathi& Kumar, 2010), (Boateng&Quan Liu, 2014), (CuongLinh, 2008), (Baro, Joyce Ebiagbe, &Zaccheaus Godfrey, 2013) others study have been referred and prepared structured online questionnaire/ Checklist with the help of software provided by Google document and circulated to the 34 Indian state university libraries that are using Web 2.0 tools. In this investigation, the investigator finalized 123 checkpoints divided into 12 Categories (Table: 1) to know the usage of Web 2.0 tools in Libraries. "Each checkpoint allotted a value 1 or 0 according to yes or no answer".

Table: 1Distribution of Categories of Checkpoint

Categories	Web 2.0 tools	Number of Checkpoints

1.	Web 2.0 Use	4
2.	RSS	12
3.	Blog	23
4.	Podcast	13
5.	Vodcast	6
6.	OPAC 2.0	11
7.	Instant Messaging	8
8.	Wikis	16
9.	Social Networking Services	12
10.	Google Docs.	4
11.	Mashup	7
12.	Social Media,Social Bookmarking, Tagging, Youtube and other	7
	Total	**123**

Methods of data analysis, interpretation, inference

Based on data collected from the online questionnaire, the Microsoft office excel, Checklist statistical techniques used to analyze data.Each checkpoint will be allotted a value 1 or 0 according to yes or no answer. The values of answer entered in Excel spread sheets.The "application index" of each library calculated by the following formula.

Application index = Total of "Yes" answers/Total of checkpoints $\times$ 100.

Data analysed and presented by Statistical text, graphical charts, tables and figures.

Results and discussions

Accessibility of Indian state university libraries URL's

The data in Figure 1 indicates that, out of 348 Indian state university libraries only 69% of libraries are having official website whereas 31% of libraries are lacking of dedicated library webpage. The state wise comparison revealed that highest website accessibility was found in West Bengal (5.7%) followed by Maharashtra (5.5%), Karnataka (5.5%), Tamil Nadu (5.2%), Gujarat (4.6%) and least accessibility of website reflects in state of Goa (0.3%), followed by Chandigarh (0.3%), Tripura (0.3%), Himachal Pradesh (0.9), Bihar (1.4%). In the state of Goa, Chandigarh and Tripura have only one state university and they are having a dedicated library website.
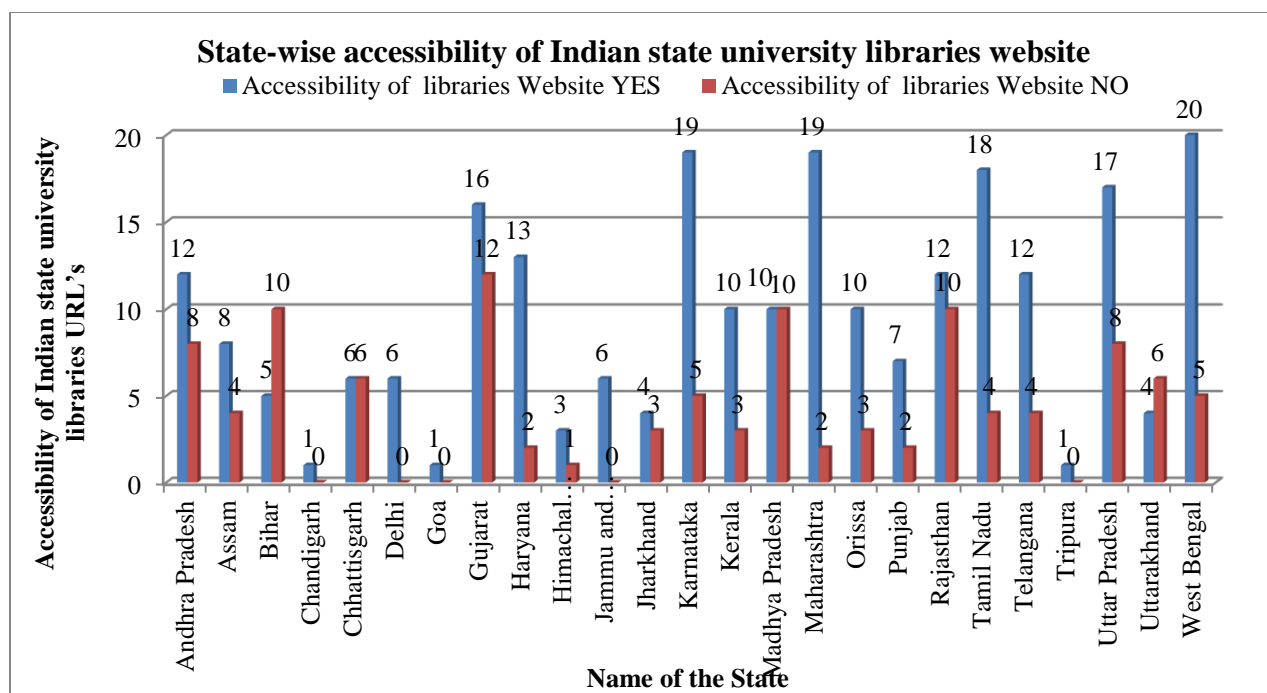
State-wise accessibility of Indian state university libraries website

- ■ Accessibility of libraries Website YES
- ■ Accessibility of libraries Website NO

Y-axis: Accessibility of Indian state university libraries URL's

X-axis: Name of the State

Figure 1Distribution of State-wise accessibility of Indian state university libraries website

Adoption of web 2.0 in Indian state university libraries

As shown in the table2, only 34 (9.77%) of the Indian state university libraries were found to be using Web 2.0 technologies and 90.23 percent of the state university libraries are still in the were not using them. Highest Web 2.0 adoption was found in Karnataka (1.44%), Assam (1.15%), Gujarat(1.15%), Kerala (1.15%) and in the state of Bihar, Chandigarh, Haryana, Jammu and Kashmir, Jharkhand, Punjab, Telangana, Tripura, Uttar Pradesh, Uttarakhand are not using any of the Web 2.0 application. In the state of Uttar Pradesh out of 25 state universities none of the university libraries are using Web 2.0 tools.

Table 2Distribution of adoption of web 2.0 in Indian state university libraries

Sr. No	Name of State	No of Universities	Adoption of web 2.0 in the University library
1.	Andhra Pradesh	20 (5.7%)	2 (0.57%)
2.	Assam	12 (3.4%)	4(1.15%)
3.	Bihar	15 (4.3%)	0(0.00%)
4.	Chandigarh	1 (0.3%)	0(0.00%)
5.	Chhattisgarh	12 (3.4%)	2(0.57%)
6.	Delhi	6 (1.7%)	3(0.86%)
7.	Goa	1 (0.3%)	1(0.29%)
8.	Gujarat	28 (8.0%)	4(1.15%)
9.	Haryana	15 (4.3%)	0(0.00%)

10.	Himachal Pradesh	4 (1.1%)	1(0.29%)
11.	Jammu and Kashmir	6 (1.7%)	0(0.00%)
12.	Jharkhand	7 (2.0%)	0(0.00%)
13.	Karnataka	24 (6.9%)	5(1.44%)
14.	Kerala	13 (3.7%)	4(1.15%)
15.	Madhya Pradesh	20 (5.7%)	1(0.29%)
16.	Maharashtra	21 (6.0%)	2(0.57%)
17.	Orissa	13 (3.7%)	1(0.29%)
18.	Punjab	9 (2.6%)	0(0.00%)
19.	Rajasthan	22 (6.3%)	1(0.29%)
20.	Tamil Nadu	22 (6.3%)	1(0.29%)
21.	Telangana	16 (4.6%)	0(0.00%)
22.	Tripura	1 (0.3%)	0(0.00%)
23.	Uttar Pradesh	25 (7.2%)	0(0.00%)
24.	Uttarakhand	10 (2.9%)	0(0.00%)
25.	West Bengal	25 (7.2%)	2(0.57%)
	Total	**348 (100%)**	**34 (9.77%)**

Application Index of Web 2.0 in Indian state university libraries

Based on data collected from the checklist, statistical techniques were used to analyze data. The checklist was transformed in to Microsoft Excel spreadsheets. Every checkpoint in the checklist was allocated a value either 1 or 0 (yes or no answers). These values were input directly in a spreadsheet. The "application index" of each university library was calculated by the following formula.

Application index = Total of "Yes" answers/Total of checkpoints X100

The maximum application index of each University library is 100. Application indexes signified the degree of adoption of Web 2.0 tools in a specific library.

Table 4Distribution of application index of Web 2.0 tools

Name of the Universities	Name of State	Total of "Yes" Answers	Application Index N=123
Dravidian University	Andhra Pradesh	7	6 (4.63%)
Sri Venkateswara Veterinary University	Andhra Pradesh	7	6 (4.63%)
Krishna KantaHandiqui State Open	Assam	26	21 (17.19%)

University	State		
University			
National Law University and Judicial Academy	Assam	34	28 (22.47%)
Assam Agricultural University	Assam	19	15 (12.56%)
Gauhati University	Assam	8	7 (5.29%)
Pt.RavishankarShukla University	Chhattisgarh	10	8 (6.61%)
Indira Gandhi KrishiVishwavidyalaya	Chhattisgarh	24	20 (15.86%)
Delhi Technological University	Delhi	22	18 (14.54%)
Indraprastha Institute of Information Technology	Delhi	23	19 (15.20%)
National Law University	Delhi	11	9 (7.27%)
Goa University	Goa	35	28 (23.13%)
CEPT University	Gujarat	15	12 (9.91%)
Smt. Hansa Mehta Library	Gujarat	40	33 (26.44%)
Saurashtra University	Gujarat	22	18 (14.54%)
Veer Narmad South Gujarat University	Gujarat	6	5 (3.97%)
ChaudharySarwan Kumar Himachal Pradesh KrishiVishwavidyalaya	Himachal Pradesh	19	15 (12.56%)
Gulbarga University	Karnataka	24	20 (15.86%)
Mangalore University	Karnataka	8	7 (5.29%)
University of Horticultural Sciences	Karnataka	17	14 (11.24%)
Mysore University	Karnataka	18	15 (11.90%)
Vesveswaraiah Technological University	Karnataka	8	7 (5.29%)
Cochin Unviersity of Science & Technology	Kerala	26	21 (17.19%)
Mahatma Gandhi Unversity	Kerala	22	18 (14.54%)
Kerala Agricultural Unviersity	Kerala	28	23 (18.51%)
Kerala University	Kerala	28	23 (18.51%)
Vikram University	Madhya Pradesh	6	5 (3.97%)
SavitribaiPhule Pune University	Maharashtra	6	5 (3.97%)
Maharashtra Animal & Fishery Sciences University	Maharashtra	12	10 (7.93%)
National Law University	Orrisa	21	17 (13.88%)
Rajasthan University of Veterinary & Animal Sciences	Rajasthan	20	16 (13.22%)

Anna University	Tamil Nadu	6	5 (3.97%)
VidyaSagar University	West Bengal	8	7 (2.29%)
The West Bengal National University of Juridical Science	West Bengal	19	15 (12.56%)
Total			**492**

Table 4 shows that the adoption of Web 2.0 technology in Indian State University libraries, highest applications found in the Smt. Hansa Mehta Library (26.44%), followed by Goa University (23.13%), National Law University and Judicial Academy (22.47%), Kerala University (18.51%), Kerala Agricultural Unviersity (18.51%), Cochin Unviersity of Science & Technology (17.19%), Krishna KantaHandiqui State Open University (17.19%), Gulbarga University (15.86%), Indira Gandhi KrishiVishwavidyalaya (15.86%), Indraprastha Institute of Information Technology (15.20%), Mahatma Gandhi Unversity (14.54%), Saurashtra University(14.54%), Delhi Technological University (14.54%), National Law University, Orrisa (13.88%), Rajasthan University of Veterinary & Animal Sciences (13.22%), The West Bengal National University of Juridical Science (12.56%), ChaudharySarwan Kumar Himachal Pradesh KrishiVishvavidyalaya (12.56%), Assam Agricultural University (12.56%) and the least adoption of Web 2.0 in Veer Narmad South Gujarat University (3.97%), Vikram University (3.97%), SavitribaiPhule Pune University (3.97%), Anna University (3.97%), Dravidian University (4.63%), Sri Venkateswara Veterinary University (4.63%).

The mean of Web 2.0 application indexes is calculated by the following formula:

Mean application Index = Total of application indexes/Number of State University Libraries

Mean = 492/34 = 14.47

Thus, the mean of Web 2.0 application indexes in selected Libraries is approximately 14 points. It is found from the Table 4.5 that the Smt. Hansa Mehta Library, The Maharaja Sayajirao University of Baroda, gained the highest application index with 26.44 points.

Distribution of State-Wise Application Index of web 2.0 in Indian state university libraries

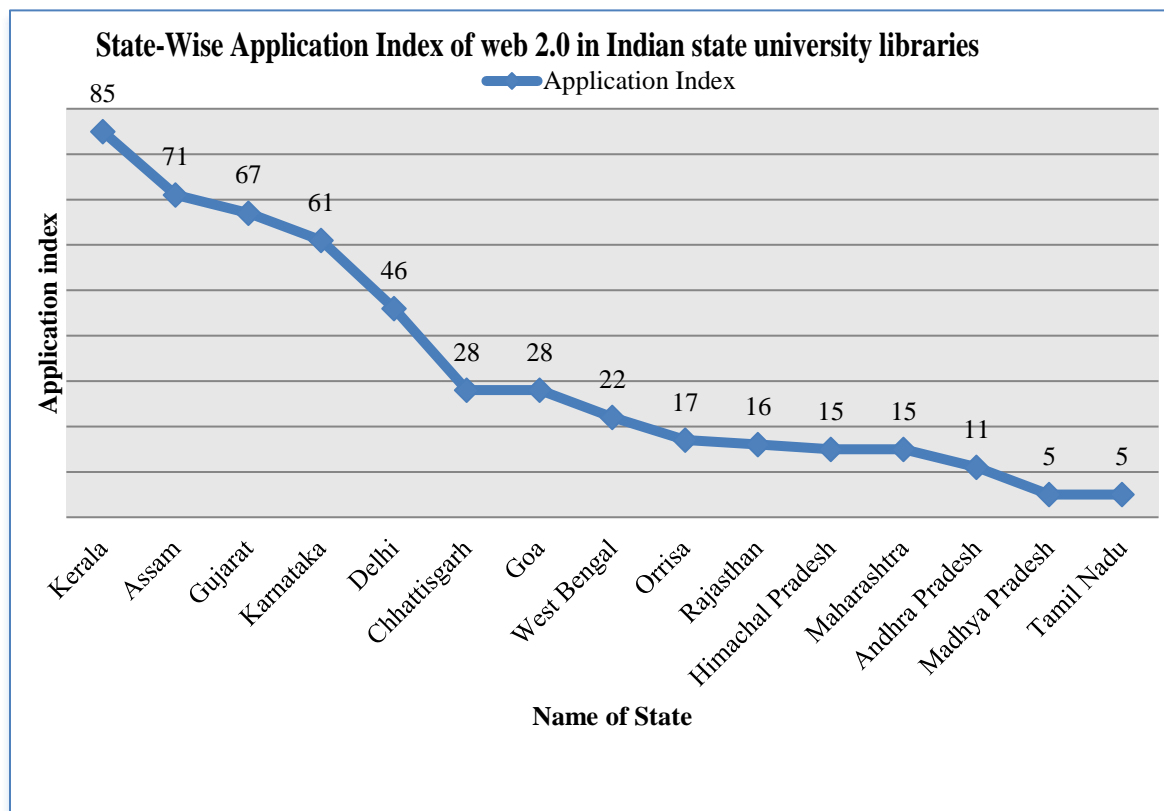**State-Wise Application Index of web 2.0 in Indian state university libraries**

Figure 2 Distribution of State-Wise Application indexes of web 2.0 tools

Figure 2 showsthat state-wise application index of Web 2.0 tools. The highest Web 2.0 application index in state of Kerala was 85 point, followed by Assam 71 point, Gujarat 67 point, Karnataka 61 point, Delhi 46 point, Chhattisgarh 28 point, Goa, 28 point, West Bengal 22 point and the least application index of Web 2.0 in the state of Tamil Nadu 5 point and Madhya Pradesh 5 point. Only 15 states university were using Web 2.0 tools other states university were not using Web 2.0 tools so the application index of other states were zero.

Adoption of various types of Web 2.0 technology tools
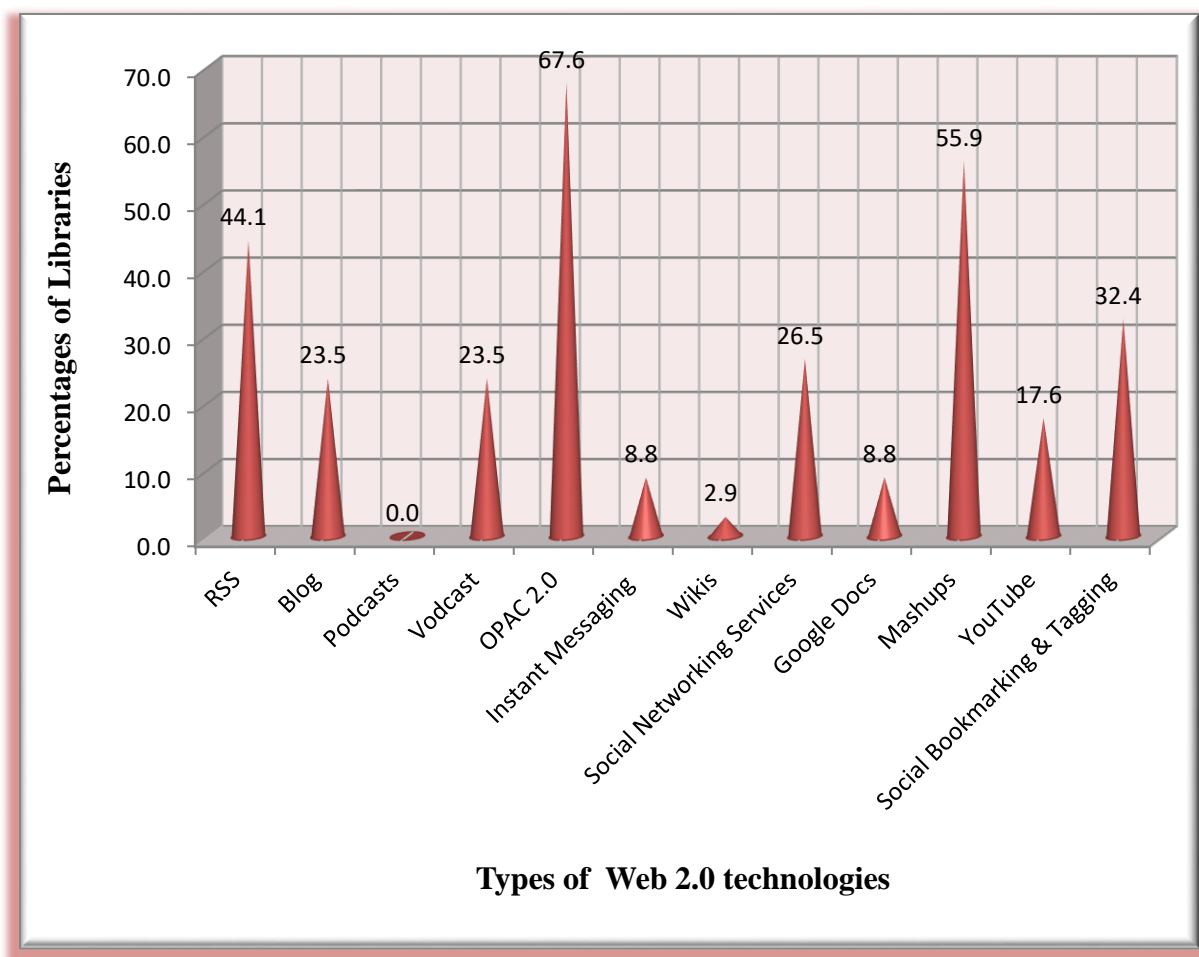
Figure 3 Distribution of Types of Web 2.0 technologies

It is evident from the Figure 3 that 44.1% of the Libraries applied RSS, 23.5% of the Libraries are using blog, 23.5% of the Libraries are using Vodcast, 67.6% of the Libraries applied OPAC 2.0, 8.8% of the Libraries are using Instant Messaging (IM), followed by 2.9% of Wikis, 26.5% of SNS, 8.8% Google Docs, 55.9% of Mashups, 17.6 % of YouTube and 32.4% of the libraries are using Social Bookmarking &Tagging. It is found from the study that none of the Libraries have adopted Podcast. The highest adoption of Web 2.0 tool is OPAC 2.0 and the least adoption of Web 2.0 tool is Wikis among the respondent libraries.

Purposes and Characteristics ofWeb 2.0 technologies

- It is found from the study that 44.1% of the State University Libraries are having RSS application to provide list of new arrival books, listing of resources in additions to institutional repository, general news/university news, library news and events, List of e-journals and e-resources databases, Announcements about workshops and exhibitions. The characteristic features of RSS in Indian state university libraries were most of the libraries provide links on library's web site/pages to download RSS and instructions given to use RSS.

- 23.5% of the State University Libraries are using Blog to provide common information, list of new books, hours of operation, holidays, list of e-resources and databases, information literacy, research tips and suggestions. The characteristic features of Blog is blog accessible to all by default, blog links is givenon library's homepage, archival entries are up to 1 year old, time and dates of postings of blog entries, categories for postings, entries are searchable, blog links given on library catalogue and instructions also accessible on blogs.

- It was found that 23.5% of the libraries are using Vodcast to provide library orientation tours and given guidance to access e-resources from on and off campus.

- 67.6% of the libraries have applied OPAC 2.0 for export book record databases, provide option for more searches from other website and search interfaces to the library's homepages. The characteristic features of OPAC 2.0 were allow patrons to save records and searches, Patrons able to make tagging, comment, rating, make book suggestion.

- 8.8% of the libraries are using instant messaging to provide reference services, suggestion on library services, and guidance with resources. Features of instant messaging in Indian state university libraries were "text-based chat" was offered and I.M. services are available eight hours a day.

- It was found that 2.9% of the State University Libraries have implemented Wikis as subject guides, project planning, listings of resource, training resources. The main features of Wikis are allows users to edit contents of Wiki, provide keyword search engine, link to library home page.

- 26.5% of the libraries are using Social Networking Services to sharing pictures/video clips, library news/events, information about library resources, marketing of library services and information about new acquisitions. Most of the Indian State University libraries are providing social networking sites links on library's homepages.

- It was found that 8.8% of the libraries are using Google Docs for create & share documents, spreadsheets, presentations.

- 55.9% of the libraries are using Mashups to retrieve title image in OPAC from Google books, Amazon and other online shopping site. Provide search interface from Google scholar, worldcat, Google books.

- It is found that 17.6% of the Libraries are using YouTube and 32.4% of the Libraries are using social bookmarking & tagging.

It is found from the study that few libraries are providing innovative library services to their patrons with web 2.0 application and Smt. Hansa Mehta Library, Gujarat has developed own

RSS for providing current alert service.Indraprastha Institute of Information Technology, Delhi adopted InstantMessaging by using "tawk.to" free live messaging app.It was suggested that other state university library should adopt this type of application for providing virtual reference services.

Recommendations

Application of Web 2.0 technology may impact relationship between users and libraries by improving involvements of users in the library activities. Now-a-days Web 2.0 tools are very popular among young generation and libraries should use this tool to provide information literacy among users in effective way. Libraries can perform in excellent way to publish and share content with library users using Web 2.0 tools. The Indian state university libraries have to adopt highly developed technologies like Web 2.0 tools to provide the most excellent services to the users. In the present study, none of the national library has adopted podcasts tool completely. Less number of libraries has adopted Wiki, Instant Messaging, Google Docs tools. The libraries have to adopt the latest web 2.0 tools like Wiki, podcasts, Instant Messaging etc. to organize the required online information resources for the benefit of patrons. The study found that in the state of Bihar, Chandigarh, Haryana, Jammu and Kashmir, Jharkhand, Punjab, Telangana, Tripura, Uttar Pradesh and Uttarakhand none of the state universities have adopted single Web 2.0 tools, so state higher education commission should take necessary action for implementation of Web 2.0 tools. University Grants Commission (UGC) has to prepare framework & guidelines for use of Web 2.0 technologies/social media for Indian State Universities.

Conclusion:

This study focus on the application of Web 2.0 tools in Indian State University Libraries that deployed any types of Web 2.0 technologies. Thus this study helps to understand the present scenario of the state university libraries related to implementation of Web 2.0 technologies. So that this study is reflects that how the Indian State Universities offering library services with web 2.0 application to library patrons at the same time this study do not evaluate the impact of these applications but obvious it is found from literature search that these applications plays very major role to connect the users and in Information Literacy. The results of this investigation will serve as a guidefor the academic libraries for planning and implementing some innovative information services through use of Web 2.0 tools. Librarians may also find this helpful once they want to implement such technologies in their libraries.

The findings of the study reflects that web 2.0 tools and technologies are open source, easy to learn, easy to install, and help to get updated in concerned field. This research has a lot of impact as it addresses the application of web 2.0 tools in libraries. It attempts to provide academic libraries with helpful information to meet needs of the their user in better way and effectively

applying of Web 2.0 technologies. It is found from the study that OPAC 2.0, blogs, Instant Messaging, Really simple Syndication (RSS), Mashups and Vodcast are very popular among the respondent libraries but still usage of web 2.0 tools for library services among the Indian State University is not encouraging and they may start library services with web 2.0 tools to provide better library services to their patronsand to create user-friendly environment.

References:

Adibi, Awele and okocha, foluke, "Adoption of Web 2.0 Applications for Education by Students in Nigeria" (2019).*Library Philosophy and Practice (e-journal)*. 2507. https://digitalcommons.unl.edu/libphilprac/2507

Allen, B., & David, R. (1990).Content analysis in library and information science research.*Library & Information Science Research*, *12*(3), 251–262.

Baro, E. E., Joyce Ebiagbe, E., &Zaccheaus Godfrey, V. (2013). Web 2.0 tools usage: a comparative study of librarians in university libraries in Nigeria and South Africa. *Library Hi Tech News*, *30*(5), 10–20. https://doi.org/10.1108/LHTN-04-2013-0021

Boateng, F., &Quan Liu, Y. (2014). Web 2.0 applications' usage and trends in top US academic libraries. *Library Hi Tech*, *32*(1), 120–138. https://doi.org/10.1108/LHT-07-2013-0093

CuongLinh, N. (2008). A survey of the application of Web 2.0 in Australasian university libraries.*Library Hi Tech*, *26*(4), 630–653. https://doi.org/10.1108/07378830810920950

Han, Z., &Quan Liu, Y. (2010). Web 2.0 applications in top Chinese university libraries. *Library Hi Tech*, *28*(1), 41–62. https://doi.org/10.1108/07378831011026689

Idiegbeyan-ose, Jerome; Okocha, Foluke; Aregbesola, Ayooluwa; Owolabi, Sola; Eyiolorunshe, Toluwani; and Yusuf, Felicia, "Application of Web 2.0 Technology in Library and Information Centres in Developing Countries: Challenges and Way Forward" (2019). *Library Philosophy and Practice (e-journal)*. 2387. https://digitalcommons.unl.edu/libphilprac/2387

Kannikaparameshwari, G., &Nikam, K. (2009).Evaluation of Web 2.0 Technologies Application in Selected Indian Libraries.Presented at the National Seminar on Management of Digital Information Sources, Bangalore: Department of Library and Information Center, RNS Institution of Technology. Retrieved from http://www.academia.edu/335141/Evaluation_of_Web_2.0_Technologies_Application_in_Selected_Indian_Libraries

Krippendorff, K. (2013). *Content analysis: an introduction to its methodology* (3rd ed). Los Angeles ; London: SAGE.

Linh, N. C. (2008). A survey of the application of Web 2.0 in Australasian university libraries.*Library Hi Tech*, *26*(4), 630–653. doi:10.1108/07378830810920950

Liu, S. (2008).Engaging Users: The Future of Academic Library Web Sites.*College & Research Libraries*, *69*(1), 6–27

Mahmood, K., & Richardson, J. V. (2011). Adoption of Web 2.0 in US academic libraries: a survey of ARL library websites. *Program: Electronic Library and Information Systems*, *45*(4), 365–375. doi:10.1108/00330331111182085

Patel, Sandip and Poluru, Lalitha. (2013). How Far or Near to 24 X 7 Libraries? Analysis of Application of Web 2.0 Tools in University Libraries of Gujarat.In *Rejuvenated Libraries for Empowered Users* (Dr. TAV Murthy Festschrift Volume, 2012–13). UK: Digital Information Research Ltd.

PEW Research Centre. (2017, January 12). Social Media Fact Sheet. Retrieved August 26, 2017, from http://www.pewinternet.org/fact-sheet/social-media

Salinas, R. (2006). A content analysis of Latina Web content.*Library & Information Science Research*, *28*(2), 297–324. https://doi.org/10.1016/j.lisr.2006.03.007

Si, L., Shi, R., & Chen, B. (2011).An investigation and analysis of the application of Web 2.0 in Chinese university libraries.*The Electronic Library*, *29*(5), 651–668. doi:10.1108/02640471111177080

Tripathi, M., & Kumar, S. (2010). Use of Web 2.0 tools in academic libraries: A reconnaissance of the international landscape. *The International Information & Library Review*, *42*(3), 195–207. doi:10.1016/j.iilr.2010.07.005

Xu, C., Ouyang, F., & Chu, H. (2009). The Academic Library Meets Web 2.0: Applications and Implications. *The Journal of Academic Librarianship*, *35*(4), 324–331. doi:10.1016/j.acalib.2009.04.003