

Web-Based Library and Information Services in the Libraries of the Institutions of National Importance in India: A Study with Reference to Karnataka, Kerala and Tamil Nadu

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Abstract - This paper focuses on the use of web-based library services in India and examines how libraries in the Institutions of National importance in India provide web access to their collections and other services. The study sample for the present study were Thirteen (13) institutions of National importance located at Karnataka, Kerala and Tamil Nadu states which were selected using purposive sampling technique based on the research objectives. The data was collected using a web-based survey by examining the library websites of the select institutions using a check-list of 52 items covered topics of library general information, library resources, library services, links to e-resources, Web 2.0 tools and Web 3.0 tools. This particular check-list was developed by the researchers after analyzing the related literature reviews and previous studies related to the topic. Finding shows that many of the surveyed Institutions of National importance in India's libraries have not fully exploited the potential of the web forms, and are still lagging behind to make the effective use of library websites. Among the selected institutions, few libraries were found to offer web-based library services in different sections. The present paper highlights the present status of the web-based library services in the select Institutions of National importance in India's librarians in Southern India. The study also highlights the role of Web 2.0 and Web 3.0 environment to enhance the quality of web-based library services and suggest new approaches for effective use of web-based library services.
Keywords: Web-based library services, Library websites, Content analysis, Web 2.0, Web 3.0, Institutions of National importance in India's Libraries

I. INTRODUCTION

The development and application of new technology, especially the Internet and web technologies have significantly changed the traditional methods of offering library and information services in the Academic Libraries. The Internet continuously offers news ways and techniques for libraries to offer their services. Today, traditional library and information services have transformed themselves into web-based services using web technologies. In today's libraries, library websites play an important role to present the library to the outside world and serve as a delivery mechanism for a library's Online collection. Library websites have become the main point of access and catalyst for new web-based library services¹.

Generally, information about libraries and library services as well as access to Online catalogues, electronic databases etc. is available on Academic library websites.

A. Web-Based Library and Services

According to Madhusudhan and Nagabhushanam (2012) web-based library services means, "library services provided using internet as a medium and library website as a gateway with the help of web-based library automation software".

Since the web-based library services are serving 24 hours service to the users, users can access to library services from their own computers without physically visiting the library. The web-based library services save time and cost to deliver information to the end-user Connell (2008), Taha (2007), Kumari (2013), Ali (2017) and Pathak *et al.*, (2008). Hence web-based library services have gained much popularity among the academic community over the past few decades.

Academic library offers various web-based library and information services to their scholarly users. Online reference service, full-text online databases, Web-OPAC, e-Journals, e-Books and virtual reference services are much popular among the users in Academic libraries. Web-based library and information services help to have a good communication between the librarians and users through online reference service / Ask-a-librarian / Chat or Frequently Ask Questions (FAQ). Academic libraries always encourage posting comments and suggestions of the academic community through emails or suggestion box to improve the quality of the library and information services. Also, Academic libraries frequently up-date their information on services such as house-keeping operations, events calendar, staff information, library rules and regulations etc. through the library website.

For this study, web-based library services means, any library service which is offered through the Internet as a platform. The services range from Online Public Access catalogues, electronic databases, document delivery services, digital and virtual libraries to Instant Messaging

services. According to White (2001) it can be defined broadly as 'an information access service in which users ask questions via electronic means e.g. email or web forms'.

The present paper highlights various web-based library services provided by the select libraries in various sections and how they were used (i.e., users' skills in effective use). In addition, the study attempts to know the problems faced by the users to access various web-based library services, their opinions on web-based library services, and expectations in web 2.0 environments.

B. Web 2.0 and Web 3.0 Tools for Library and Information Services

Web 2.0 and Web 3.0 technologies are playing very important role in present day libraries. These technologies allow anyone to create and share online information or material they have created. The Web 3.0 is known as 'Semantic' web where like humans machines read web pages and provide precise information to users. Web 3.0 technologies organize information on the Internet in a logical way and present the customized information to the users. Such technologies allow people to create, share, collaborate and communicate information and do not require special skills to design, publish information or participate. Because of their simple nature and easy to use, the technologies are becoming popular among the people of all ages. A key feature of such technologies is to allow communication either to a select group of people or to a wider audience. The libraries can make use of these tools to communicate with students, staff and the wider academic community.

The technologies are effective ways for interaction and communication among students, research scholars, experts and faculty members. Web 2.0 applications are of various types including wikis, blogs, social networking, microblogs, tagging, podcasting, content hosting services etc. Most popular websites include Facebook, Youtube, Twitter, Wikipedia, MySpace, Instagram etc. Libraries use Web 2.0 and Web 3.0 tools for many purposes like promotion, information delivery, user interaction and professional development.

II. REVIEW OF LITERATURE

Many studies have been conducted on the subject. Bhatnagar (2005) in her study listed different resources for web-based library services like OPAC, Gateways, Portals, Subject Portals, Electronic journals, Online databases, Search engines and Subject directories. She further listed new web-based library services in her study like virtual library tours, Ask-A-Librarian, Real-time services, Bulletin Boards, web-based user education and web-forms. She further stated that as the Internet will become more common throughout the world, web-based library services will become more widespread and sophisticated. Libraries have to continuously address the issues related to the web design

and various implementation issues. As the libraries are actively shifting their library services but the main purpose of libraries remains the same, to serve and inform users to find, evaluate, and use information effectively.

Madhusudhan and Nagabhushanam (2012) studied about how users are using various web-based services in different sections of university libraries in India and examined the ways of offering web access to library collections by University libraries and the user support for that access and the problems faced by users to access such web-based library services. The findings of their study revealed that many of the surveyed university libraries have not fully exploited the web forms, and are lagging behind to use the library websites effectively while as their study found that a few libraries offer innovative web-based library services in different sections. Bao (2005) conducted a study of 143 institutions of higher education to know the percentage of Academic libraries providing web-based interactive reference services through their home pages and how such services are being provided through the home pages. The researcher found that 46.9% Academic libraries were providing web-based interactive reference services and the most popular words used to describe the reference link were 'Ask a Librarian' and 'Ask a reference question'. The study found that 71.6% libraries provided these services through a reference request form, and 18 (26.9%) through an e-Mail link only. One library was found to have a reference discussion forum (posting questions and answers asynchronously) and a reference chat room (posting questions and answers synchronously).

Zarei and Abazari (2011) studied web-based services offered by Asian national libraries and found that National Library of Singapore had the first rank in providing its services via a web site for users and was the only national library in Asia that provides more than half of its services (52.29%) via the web site. Many of its services, such as services to publishers and bibliographic services, are offered completely via its web site. Only services to the handicapped and blinds, and education and training are not provided via its web site. The study found that other national libraries in countries like Japan, Malaysia, China, Iran, Israel, Sri Lanka, and Kyrgyzstan also provided web-based services in range of 25-50%, respectively in descending order. Rest of the national libraries provided Online services under 25%. Data showed that these national libraries provide in-house information to their users rather than service provision for end-users via the web. The study showed that libraries were offering various types of web-based services like services to publishers, services to libraries and librarians, services to end-users, bibliographic services, Accessibility of services and web-based education and research services.

The importance of websites is paramount to offer web-based services which have been greatly impacted by web 2.0 and Web 3.0 technologies. Blakiston (2013) explored the way of developing content strategy for Academic library

website in university of Arizona libraries. She stated that Academic library websites contain vast amount of complex content but there is a lack of established process for creating, updating and deleting the content due to poor checklist, guidance and vision. Si and Ranaweera (2016) in their study stated a number of studies conducted on the adaption of Web 2.0 features in university libraries like Miller (2005), Maness (2006), Shoniwa and Hall (2007), Nguyen (2008), Aharony (2012), Raju and Harinarayana (2008), Kim and Abbas (2010), Mahmood and Richardson (2011) who in their studies investigated the functionality of Web 2.0 features such as Really Simple Syndication (RSS) feeds, social networking sites, blogs, instant messaging (IM), wiki, user tagging, file and image sharing, etc. Si and Ranaweera (2016) conducted a web-based survey to investigate the web-based library services of university libraries in Sri Lanka and found that there were not a single university library website contained all 55 items in the check list. It was found that library of University of Colombo has the highest number of items which is 39 items (69.64%) in the checklist. Library of University of Ruhuna was having 35 items (62.5%) and library of University of Peradeniya was having 34 items (60.71%), hold the second and third highest numbers of items in the checklist.

III. OBJECTIVES OF THE STUDY

The current study will focus on the following objectives

1. To identify the Institutions of National importance Library websites in India which have web-based library and Information Services;
2. To investigate the web-based library and information services in the Institutions of National importance libraries in India.
3. To evaluate the institutional resources and processes in order to support web-based library services;
4. To give suggestions to improve the current web-based library services in the surveyed institutions.

IV. SCOPE AND LIMITATIONS OF THE STUDY

The scope of present study is “Web-based library and Information Services in the Libraries of the Institutions of National importance in India: A study with reference to Karnataka, Kerala, Tamil Nadu” and the study is limited to the Institutions of National importance in Karnataka, Kerala and Tamil Nadu.

V. METHODOLOGY

The study was conducted in three phases. At the first phase, the study sample was selected from the list of Institutions of National importance in India located in the Ministry of Human Resource Development website which has listed 91 institutions under this category MHRD (2018) (<http://mhrd.gov.in/institutions-national-importance>). Out of them, 13 institutions are located at Karnataka, Kerala and Tamil Nadu states.

All the libraries of these institutions were selected as the study sample using purposive sampling technique as per the research objectives. However, due to the under construction of the library websites of IIT-Kottayam and Tiruchirapalli and no library website in Academy of Scientific and Innovative Research and Dakshina Bharat Hindi Prachar Sabha, Chennai, these institutions were excluded from the sample and 09 library websites from the remaining institutions were taken as the study sample for this survey.

The second phase of the survey was to develop a checklist, as the research instrument; to analyze the web-based library and information services in the institutional libraries. This check list was based on previous studies which were conducted by Si Li and Ranaweera (2016) and Madhusudhan and Nagabhushanam (2012) and it was modified by the researchers according to the objectives of the study. The checklist contained 52 items divided into following six categories: Library General Information; Library Resources; Library Services; Links to e-resources; Web 2.0 Tools and Web 3.0 Tools. Table 2 to 8 shows the items of the checklist under the above mentioned six categories.

The third phase of this study was web-based content analysis through designed checklist. The content of the library websites’ was surveyed between 3rd September, 2018 to 10th September, 2018. Each institution website was observed two times and availability of items in the checklist was marked with “1” and “0” which symbolized the availability and non-availability of the items. The data was entered into Excel spreadsheet and analyzed by simple method of frequencies and percentages. Survey results are presented in Table II to Table VIII.

VI. ANALYSIS OF DATA

The analysis of the data as shown in Table II reveals that Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram has 02 items on the library website out of the 52 items contained in the check list. Indian Institute of Information Technology, Dharwad has 07 items on its website while as Indian Institute of Science Education and Research, Thiruvananthapuram and Indian Institute of Technology, Madras has 27 items on their websites respectively out of the 52 items contained in the check list. The analysis further reveals that National Institute of Technology, Calicut has 19 items on their website and National Institute of Technology, Surathkal has the highest number of items i.e. 33 on their website out of the total number of items contained in the checklist. National Institute of Technology, Tiruchirapalli has 17 items on the website and Rajiv Gandhi National Institute of Youth Development, Sriperumbudur has 18 items on the website while as Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram has 21 items on the library website out of the 52 items contained in the check list.

TABLE I LIST OF SURVEYED INIS LIBRARIES WITH URLS

S. No.	Name of the Institute	Code	URL of the Library
1	Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram	IIITDM-K	http://www.iiitdm.ac.in/old/academics%20-%20library.php
2	Indian Institute of Information Technology, Dharwad	IIIT-DWD	https://www.iiitdwd.ac.in/library
3	Indian Institute of Science Education and Research, Thiruvananthapuram	IISER-TVM	http://www.iisertvm.ac.in/pages/iiser_tvm_library.php
4	Indian Institute of Technology, Madras	IITM	http://www.cenlib.iitm.ac.in
5	National Institute of Technology, Calicut	NITC	http://www.library.nitc.ac.in/index.html
6	National Institute of Technology, Surathkal	NITK	http://library.nitk.ac.in/index.html
7	National Institute of Technology, Tiruchirapalli	NITT	https://www.nitt.edu/home/students/facilitiesnservices/library/
8	Rajiv Gandhi National Institute of Youth Development, Sriperumbudur	RGNIYD-S	http://www.rgnyd.gov.in/content/central-library
9	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram	SCTIMST	http://library.sctimst.ac.in

TABLE II NUMBER OF ITEMS IN LIBRARY WEBSITES

S. No.	Name of the Institute	Frequency	Percentage (%)
1	Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram	2	3.80%
2	Indian Institute of Information Technology, Dharwad	7	13.40%
3	Indian Institute of Science Education and Research, Thiruvananthapuram	27	51.90%
4	Indian Institute of Technology, Madras	27	51.70%
5	National Institute of Technology, Calicut	19	36.50%
6	National Institute of Technology, Surathkal	33	63.40%
7	National Institute of Technology, Tiruchirapalli	17	32.60%
8	Rajiv Gandhi National Institute of Youth Development, Sriperumbudur	18	34.60%
9	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram	21	40.30%

TABLE III LIBRARY GENERAL INFORMATION

S. No.	Items	Frequency	Percentage (%)
1	Introduction of the library	9	100
2	Library collections	7	77.78
3	Vision and Mission	1	11.11
4	Membership details	6	66.67
5	Hours of operation	7	77.78
6	Rules, policies and procedures	6	66.67
7	Library events and news	1	11.11
8	Mail to librarians / Mailing service	7	77.78
9	Staff directory	7	77.78
10	Virtual reference desk/Ask-a-librarian	3	33.33
11	Library newsletter	0	0.00
12	Annual reports/ Library statistics	1	11.11
13	Library gallery	8	88.89
14	Web-based user education/virtual-library tour	0	0.00
15	Floor plan / Library map	1	11.11
16	Visitor count	0	0.00
17	Site search	0	0.00
18	Frequently asked questions	1	11.11
19	Online feedback form	0	0.00
20	Contact details	7	77.78

Table III shows that all the libraries have provided 'information of the library' on their websites followed by information regarding the 'Library gallery' which is available on 88.89% library websites. Information regarding 'Library collections', 'Hours of operation', 'Mail to librarians / Mailing service', 'Staff directory' and 'Contact details' are provided by 77.78% libraries respectively on their websites. 66.67% libraries have put 'Membership details' and 'Library Rules, policies and procedures' on their library websites. Only 33.33% libraries have 'Virtual reference desk/Ask-a-librarian facility' on their websites while as only 11.11% libraries have information regarding 'Vision and Mission', 'Library events and news', 'Annual reports/ Library statistics', 'Floor plan / Library map' and 'Frequently asked questions' available on their websites. The analysis further reveals that no library has information regarding 'Library newsletter', 'Web-based user education/Virtual-library tour', 'Visitor count', 'Site search' and 'Online feedback form' available on their websites.

TABLE IV LIBRARY RESOURCES

S. No.	Items	Frequency	Percentage (%)
1	WEB-OPAC	7	77.8
2	Institutional Repository/ Digital library	5	55.6

Table IV reveals that 77.8% libraries have the facility of 'Web OPAC' on their websites while as 55.6% libraries have 'Institutional repository / Digital library' available on their websites.

TABLE V LIBRARY SERVICES

S. No.	Items	Frequency	Percentage (%)
1	Web-based document delivery service	4	44.44
2	Citation style guides and tools	5	55.56
3	New arrival list	6	66.67
4	Online subject gateways	3	33.33
5	Plagiarism checking tool	3	33.33
6	Web-based Inter library loan service	5	55.56
7	Article alert service	2	22.22
8	Pro-active web-based TOC	2	22.22
9	Previous exam papers	1	11.11
10	Online books indent / Request form	5	55.56

As shown in Table V, 66.67% libraries have 'New arrival list' on their library websites followed by 55.56% libraries which have 'Citation style guides and tools', 'Web-based Inter library loan service' and 'Online books indent / Request form' available on their library websites while as 44.44% libraries have 'web-based document delivery service' available on their websites. 33.33% libraries have

the information regarding 'Online subject gateways' and 'Plagiarism checking tool' available on their websites while as only 22.22% libraries have 'Article alert service' and 'Pro-active web-based TOC' available on their websites. The analysis further reveals that only 11.11% libraries have information regarding 'Previous exam papers' available on their library websites.

TABLE VI LINKS TO E-RESOURCES

S. No.	Items	Frequency	Percentage (%)
1	Subscribed full text e-Journals database	8	88.89
2	Subscribed full text e-Books database	7	77.78
3	Subscribed bibliographic databases	7	77.78
4	Electronic theses and dissertations	6	66.67
5	Open access e-Resources database	3	33.33
6	Open access e-Journals	3	33.33
7	Open access e-Books	2	22.22
8	Course materials	2	22.22
9	Patent and Standards	2	22.22

The investigator further examined the facilities regarding various types of e-Resources on the library websites. Table VI reveals that 88.89% libraries have subscribed to full text e-Journals database followed by 77.78% libraries which have subscribed to full text e-Books database and Bibliographic databases. 66.67% libraries have 'Electronic theses and dissertations' while as 33.33% libraries have information regarding 'Open access e-resources database' and 'Open access e-Journals'. 22.22% libraries have information regarding 'Open access e-Books', 'Course materials' and 'Patent and Standards' on their library websites.

TABLE VII WEB 2.0 TOOLS

S. No.	Items	Frequency	Percentage (%)
1	Library instant messaging/ Chat with Librarian	1	11.11
2	RSS feed / Online integrated push-based-services (e-Mail based)	3	33.33
3	Library Social networking (e.g. Facebook, MySpace, Twitter)	3	33.33
4	Library use tagging (e.g. Delicious)	0	0.00
5	Library blog	2	22.22
6	Library wiki	0	0.00
7	YouTube	0	0.00
8	Online map of the library /Library mashups (e.g. Google map)	1	11.11

Table VII reveals about various web technologies available on the library websites and shows that 33.33% libraries have ‘RSS feed / Online integrated push-based-services (e-Mail based)’ and ‘Library social networking (e.g. Facebook, MySpace, Twitter)’ on their library websites while as 22.22% libraries have ‘Library blog’ and only 11.11% libraries have ‘Library instant messaging / Chat with Librarian’ and ‘Online map of the library / Library mashups (e.g. Google map)’. The analysis further reveals that no library uses ‘Tagging (e.g. Delicious,)’, ‘Wiki’ and ‘Youtube’.

TABLE VIII WEB 3.0 TOOLS

S. No.	Items	Frequency	Percentage (%)
1	Mobile library website	0	0.00
2	Mobile Web-OPAC	0	0.00
3	Quick response code (QR Code)	1	11.11

Table VIII reveals that no library has a ‘Mobile library website’ and ‘Mobile Web-OPAC’ while as only one library (11.11%) libraries have ‘Quick response code (QR Code)’ on the library website.

VII. FINDINGS

The findings reveal that National Institute of Technology, Surathkal is leading the universities as for as the items from the checklist are concerned followed by Indian Institute of Science Education and Research, Thiruvananthapuram and Indian Institute of Technology, Madras, having more than 50% of the information available on their websites as categorized in the checklist. Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram has the least number of items on the library website (3.8%) from the checklist.

As for as the general information regarding the libraries is concerned it is clear from the analysis that information about the library is provided by all the libraries while as majority of the libraries have their library galleries available on their websites as well as information regarding ‘Library collections’, ‘Hours of operation’, ‘Mail to librarians / Mailing service’, ‘Staff directory’ and ‘Contact details’ are also provided by majority of the libraries. A good number of libraries (66.67%) have also provided information about ‘Membership details’ and ‘Library rules, policies and procedures’ on their library websites. However, it is surprising that no library has information regarding ‘Library Newsletter’, ‘web-based user education/virtual-library tour’, ‘Visitor count’, ‘Site search’ and ‘Online feedback form’ available on their websites.

The information regarding library resources like Web-OPAC is available on majority of the library websites while as a good number of libraries (55.6%) have Institutional repository / Digital library.

Information regarding various library services reveal that majority of libraries have ‘New arrival list’ on their library websites while as a good number of libraries (55.56%) have ‘Citation style guides and tools’, ‘web-based inter library loan service’ and ‘Online books indent / Request form’ available on their library websites. The findings further reveal that only one library has put information regarding the previous exam papers available on the library website.

As for as the links to e-Resources on library websites’ are concerned, it is clear that majority of the libraries have provided links to their subscribed full text e-Journals databases, subscribed full text e-Books databases, Bibliographic databases and e-theses and dissertations while as less number of libraries have provided links to ‘Open access e-Books’, ‘Course materials’ and ‘Patent and Standards’ on their library websites.

Majority of the libraries have not adopted various Web 2.0 and Web 3.0 tools in their libraries and the findings reveal that less number of libraries (33.33%) have ‘RSS feed / Online integrated push-based-services (e-Mail based)’ and ‘Library social networking (e.g. Facebook, MySpace, Twitter)’ on their library websites. The analysis further reveals that no library uses ‘Tagging (e.g. Delicious,)’, ‘Wiki’ and ‘Youtube’ in their libraries which is very surprising.

As for as the adoption of Web 3.0 tools is concerned like Mobile library website and Mobile library OPAC, the analysis reveals that no library has a ‘Mobile library website’ and ‘Mobile Web-OPAC’ while as only one library (11.11%) libraries have ‘Quick response code (QR Code)’ on the library website.

VIII. SUGGESTIONS

1. A proper infrastructure should be available in libraries to provide web-based library services.
2. Libraries should use the websites to their full potential, include as much information regarding the library as possible and update the content frequently.
3. Libraries should adopt relevant Web 2.0 and Web 3.0 technologies in their libraries.
4. Libraries should make use of Web 2.0 and Web 3.0 tools to interact with users and provide document delivery services.
5. A proper training should be provided to library professionals as well as users to use the Web 2.0 and Web 3.0 tools.

IX. CONCLUSION

Web-based library and information services are not just a technology or a thing but a new paradigm and a state of mind. Library websites are the focal points to provide access to library collection and services. However, the present study reveals that majority of the libraries are not using websites’ and web technologies to their full potential.

Libraries around the world are reaping the benefits of web technologies and have changed the way to interact with their users and provide document deliverer services.

Web 2.0 technologies are implemented in libraries to ameliorate the processes and the paradigms of the information services offered by various types of libraries. The trend is to integrate various technologies and tools of Web 2.0 and Web 3.0 into different library operations and services to make communication and interaction with users more effective and efficient and reach out to them and offer better services. The technologies will aid Academic libraries to accomplish their key role of information dissemination, thereby fulfilling the institutional goals of teaching, learning and research activities. Thus, librarians need to utilize these interactive and collaborative opportunities offered by Web 2.0 and Web 3.0 technologies to enhance the user experience towards libraries and have a strong association with them.

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