

Evaluation of Academic Library Websites in Tamilnadu and Puducherry

Mr. Md Azizur Rahman

MLIS Student
Library and Information Science
Pondicherry University

Abstract

The study entitled “Evaluation of Academic Library Websites in Tamil Nadu and Puducherry” explores the results of the efficiency of academic library websites in providing information to the end users. To accomplish the objectives of research, a data sheet was designed to collect the data from 7 Academic Library websites. It included questions on the parameters such as Quality of Website design, Information Accuracy, Current information, Extensive of the coverage information, Content analysis and Resources availability. All the websites of the selected Libraries were browsed and recorded the data in the data sheet. It was found that there is a significant demand for the provision of generic tools to support Academic information functions of Library services. There is an overall lack of awareness as to what e-information tools and services already exist world-wide. Ultimately, the quality of information will be enhanced by engaging students/users through library portal provided on Academic Library websites.

Keywords: E-resources, world wide web, academic library websites, Tamil Nadu, Pondicherry, Puducherry, evaluative study.

1. Introduction

In an academic institution, the library is known as knowledge and learning resource where the users gather information from various information sources as per their information needs. Offline information available within libraries is converting into online information that is imparting through various resources and accessible on 24x7 platform and in different formats. Academic institution library of all types are recognizing the importance of the world wide web as a tool, not only for gaining access to information, but also as a means of disseminating information about their activities, products and services. The help of library websites makes possible for library professionals to provide information to the library users in an efficient way. Thus, information literacy instruction can be delivered through the library websites.

Libraries also use their websites for disseminating information among user and to popularize their services. Content richness of library websites depends upon its collection, services, facilities, administrative support and updating policy etc. These features are collectively referred as content awareness of library websites. Content Analysis indicates qualitative and quantitative aspects of

information provided on the library websites. Evaluating library websites through content awareness is one of the methods for measuring usefulness of websites.

1.1.1 Academic library website – Features

Academic library websites can offer:

- Interaction with the library catalog through an Online Public Access Catalog (OPAC) which provides the ability log to a library account in order to renew or request items.
- It is a gateway to electronic resources. Libraries may organize the various periodical indexes, electronic reference collections and other database. Library tutorials which help users to choose and use electronic resources, how to renew a book, and other library functions.
- Virtual reference to connect remote patrons with library staff in order to answer the questions for user through emails and texting.
- Library Blogs which can announce new resources or services at the library and give to remote patrons another venue to communicate with staff and provide feedback.

The World Wide Web has revolutionized the communication scenario around the globe. The websites of academic institutions have now emerged as the prime source of information regarding the institutions. As the internet has become a major source of information, library websites are also selected frequently to obtain scholar and educational resources in academic institution. A library website plays a role as an extension and increase of a traditional physical library and information sciences. Websites have been applied as a method of evaluation and analysis in several fields in particular web, system design, and human computer interaction.

Now the users are not only mere information consumers but are content creators also. In this context, libraries have to integrate several technologies in their services in order to effectively attract and satisfy the users. Mahamood and Richardson (2011) found that all the libraries were using web 2.0 tools for sharing news, marketing their services, providing information literacy instruction, information about print and digital resources, and soliciting feedback of users.

Technology-led developments have created new opportunities and challenges for libraries promotion, dissemination and storage of information. The library is one of the many institutions under-going change in the facing technological advances. Online services have transformed themselves into web-based services using web technologies. The web also offers libraries the potential for more revolutionary change as well. Library websites have become the main point of access and catalyst for new web-based library services.

In recent years, the web has constantly been gaining importance as a platform for applications. Earlier web applications were simple and used static page layout, whereas, now the websites offer sophisticated applications with user interfaces. |The other library, such as OPAC, electronic databases, peer-reviewed journals, reference services etc. The growth of distance learning and the need to offer services for patrons off campus as well as in the library, stimulated the search of

other ways to deliver library information skills. The WWW distributing information over a large network and web-based instruction is becoming the desired tool for these new users. In the web environment it doesn't does not matter if the user is connecting to library resources on the computer in the library, elsewhere on campus or from his/her home.

1.2 Role of Library Websitesn in Knowledge Dissemination

Library websites are most important for information or knowledge dissemination in this technology era. The development in communication and information technology, opened many possibilities in the past decade for designing the websites. They disseminate not only the information pertinent to organization but also to their related resources.

Academic library websites may allow student to develop different activities such as: to browse all types of e-learning sessions and library catalog-material, as well as download lecture notes among others. Academic library websites are multifaceted communication devices which are increasingly used for a wide variety of purposes, from attracting new students to providing online education. Also, they can also disseminate findings, either by hosting online articles or publishing summaries, data sets or tools. Specially in the academic library domain there are three general audiences regarding their user (visitor) view, namely current and prospective students (visitor like outside also), academic personnel such as researchers and professors and research sponsors for creating knowledge dissemination. Therefore, library websites are effectively valuable creation of a stable management structure, building on a decade and a half of remarkable voluntary administration. In library website knowledge can be effectively disseminated. Feedback particularly today, on how to improve knowledge dissemination in parallel with 'development' initiatives, is always sought and valued.

1.3 Characteristics of Library Websites

- Users generally scan the page instead of reading consecutively. They Spend Minimum Time So Should Be Able To Recognize How They Can Get To Required Information. e.g. 'Content Information' Should Be Accessible From Every Page of Library Website.
- Page loading/information Retrieval in Progress Conveys Accurate Status Messages to Easily Availability of Information.
- Access the Use of Website Product to Achieve the Desired Task With Ease.
- It is Effectiveness is In the Information Seeking Process.
- Access Easy It is to learn the Site, the Progression from Novice to Skilled User.
- Library Website Are easily determined, e.g. Help file, Guide, Online Tutorials, Online Learning Material etc.
- It Should Be Clearly Stated What is Searched When a User Clicks on 'Search', i.e. whether 'Catalogue'.
- Adequacy & Comprehensibility of Terms & Phases to Describe Functions or Content which are Familiar to the User.
- To Find and Sort Material for a Research Project on a Specific topic/subject.
- e.g. A library Website Should Cover Under "e-resources" like Subscribed e-resources, Open

Access Resources, Digital Contents, Audio-Video, CD-ROMs, Patents, Standards etc.

1.4 What Is Evaluation?

Evaluation is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards. It can assist an organization, program, project or any other intervention or initiative to assess any aim, realizable concept/proposal, or any alternative, to help in decision-making; or to ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed. The primary purpose of evaluation, in addition to gaining insight into prior or existing initiatives, is to enable reflection and assist in the identification of future change. Evaluation is often used to characterize and appraise subjects of interest in a wide range of human enterprises, including the arts, criminal justice, foundations, non-profit organizations, government, health care, and other human services. It is long term and done at the end of a period of time.

1.5 What Is Content Analysis?

Content analysis is "a wide and heterogeneous set of manual or computer-assisted techniques for contextualized interpretations of documents produced by communication processes in the strict sense of that phrase (any kind of text, written, iconic, multimedia, etc.) or signification processes (traces and artifacts), having as ultimate goal the production of valid and trustworthy inferences". Content analysis has come to be a sort of 'umbrella term' referring to an almost boundless set of quite diverse research approaches and techniques. Broadly, it can refer to methods for studying and/or retrieving meaningful information from documents. In a more focused way, content analysis refers to a family of techniques for studying the "mute evidence" of texts and artifacts.

1.6 Statement of The Problem

Websites are best source for Information for Outsiders. They are the mirror of the library. The preliminary idea about the library can be achieved from the Website. From the preliminary studies it was found that:

- Most of the university libraries websites are providing generalized information.
- Content quality of the websites is not up to the level of satisfaction.
- The information is not up-to-date.
- Required information is not provided in detail.

The above context has raised some research problems that are stated as follows:

- How to increase the content quality of the library websites?
- How to make the library home pages interactive?
- How to identify the various purposes for which the library web pages have been retrieved?

- How to find out the level of the web based library service reflected in the under study library websites?

1.7 Objectives of The Study

The study was conducted with the following objectives:

1. To analyze the requisite features of websites that makes the people to believe the academic websites.
2. To identify the parameters expected for evaluating the effectiveness, efficiency and content of academic websites.
3. To ascertain the user interface and performance effectiveness required in the academic websites.
4. To identify how to effectively organize and structure information in academic websites so as to cater appropriately to the diverse needs of different groups of user and different domains.
5. To identify whether it is necessary to consider cultural differences in organizing structuring information on academic websites.
6. To identify whether all the academic websites include library related information and the availability of resources.

1.8 Scope and Limitations

The study was confined to the University Websites of Tamil Nadu and Pondicherry. These websites were further selected according to the availability of the library portals. As State and Central Universities are offering degrees in various subjects and are deemed University, therefore they are included in the study. But due to the non-unavailability of the library website, all of the university websites of Tamil Nadu could not be covered in the study. In total there are 22 academic Universities (without IIT or other special Universities) in Tamil Nadu but the researcher has undertaken only 7 (5 State & 2 Central) university websites for evaluation.

2. Literature Review

2.1 Introduction

This section highlights previous studies related to various usability attributes, usability criteria for evaluating library websites and analysis. Different studies conducted on various issues of the library website evaluation, content analysis. Literature search to studies on the efforts made by foreign institution particular the academic institutions for evaluating websites.

2.2 Related Studies

Buchanan and Salako (2009) highlight the issue of evaluating usability. Folmer and Bosch (2004) described the concept of usability and gave an overview of the methods for evaluating usability. Raward (2001) advocated for a centered design model for academic library WebPages.

Rocha (2012) proposed a website quality evaluation framework based on three dimensions of websites: Content quality, service quality and technical quality. However the majority of today's library users are those who were born into the internet age and whose scholarly research habits are tightly bound with their overall internet experience (Sadeh, 2007).

Web-based library services are modified versions of existing services (Arora 2001) or transformed from traditional library services incorporating new services that are peculiar to web environment (Mayo, 2004).

Similarly Tsakonas and Papatheodorou (2006) present a model which analyses the attributes of 'electronic information services' components taking 'system', 'user' and 'content' into account as framework in the process of their mutual interaction. For usefulness, they suggest relevance, format reliability, level and timeliness as the five resources attributes viz; ease of use, aesthetic appearance, navigation, terminology and learn ability have been taken into account.

Fogg et al. (2012) gathered the comments people wrote about each site's website get noticed when people evaluate credibility. The team found that the design look of the site was mentioned most frequently followed by comments about information structure and information focus. In this study, 2,684 people evaluated the credibility of two live websites on a similar topic (health) and the author shared participant's comments in the top 18 areas that people noticed when evaluating websites credibility.

Fogg (2012) also proposed a theory that users notice and interpret various websites elements to arrive at an overall credibility assessment.

Karp and Karp (1998) offered guidelines about the web designing through not directly related to web credibility. Adopting those guidelines explain intelligent use of graphic elements and design that can add greatly to the attractiveness of a webpage.

According to Connell (2008), "A library website is an integral part of a library's identity. Many patrons visit library's virtual location, its physical location. Library website function as portals for research and marketing tools." Traditionally, the evaluation of academic libraries was performed primarily by accessing the extent of the physical library use and the user satisfaction with academic libraries printed collection. With the increased use of web based services and services and features, the overall evaluation of academic library must now include not only the use of physical facility and printed collection but also online usage and electronic resources.

Similarly, Tsakouas and Papatheodorou (2006) present a model which analyses the attributes of electronic information services components taking 'system', 'user' and 'content' in to account as framework in the process of their mutual interaction.

Chao (2002) provides detailed features (indicators) as checklist both at indicative (macro) and illustrative (micro) level. These are summed up as: presentation, suitable background, colour, front, icon, image, size, layout and text.

Sasikala (2003) reports the finding taking a case study for pace university library which framed certain set of questions at illustrative (micro) level, and are helpful in evaluating the validity and usability of website. For example, a few questions covered are: Is there another information source that we know of where we could find this information or check for accuracy?.

Mangala and Hirwade (2005) evaluated the websites of Indian universities with special reference to their libraries web pages. Two hundred and seventy three Indian universities were selected for this study. Out of there, 91(59.87%) have included information about their libraries in their websites. Major findings and suggestions were presented and directory of Indian university websites were created as a by-product of the study.

Library portal reflects the strengths and weakness of the libraries very effectively. Library should make consistent efforts to provide web based services to their user (Kanamandi & Kumbar, 2006). Academic libraries are quickly becoming the major players in adopting and incorporating web 2.0 applications into their services compared with other types of libraries (Xu et al., 2009). For example, RSS feeds can inform library users about new library activities, while blogs enable the library to aggregate knowledge from users (Kim & Abbas, 2010).

Academic librarians are trying to find out what the students and faculty believe the library is doing well and also what could be improved in providing materials and services. Apart from comment cards and regular library surveys, a new media format called weblog or blog is being used to allow libraries and library users-students and faculty, to express their concerns, air their opinions and exchange their ideas (Zhuo, 2006).

Nielsen and Rubin (2015) pioneered the testing of websites to determine whether website meet the needs of users. They adapted usability engineering techniques developed for computer software design and applied them to web design. The usability is recognized as an important quality factor of any modern website. Usability testing has since become the focus of considerable has since become the focus of considerable attention both for commercial and academic website.

Head and Fichter (2000) each furnished a good synopsis of usability testing and delineated the possible hazards for test givers and test takers which as likely to be encountered.

Rogers and Preston (2009) used the combination of ‘experimental’ and ‘respondent research strategies’ and included survey questionnaire’, ‘focus group’, ‘formal usability testing and ‘card shorting’ to design the Caribbean academic library website to access the strength and weakness. It is also suggested that in libraries, usability training should be conducted for the evaluation purpose.

Tobin and Kesslerman (2000) conducted the”Evaluation of web-based library instruction programs According to them, there was the potential in the academic libraries to meet the library users needs by developing new ways through WWW. They contended the academic libraries have the potential to fulfill the library users’ needs via WWW.

Zaphirs and Ellis (2001) conducted a study on website usability and content accessibility of the top 50 USA universities. In their investigation these universities were ranked on the basis of two factors: one was accessibility and second was usability. The evaluation was carried out by using two automatic tools; bobby and lift. For most of the websites at universities usability rating was very low, while in the case of website content accessibility guide, the complaint rate was very low. Finally it was suggested that the size of the website in KB was the driving variable for both the usability and accessibility.

According to Battleson, Booth and Weintrop (2001) assessment was considered an invaluable tool to evaluate the effectiveness and ease of academic library websites. They described the principles regarding usability evaluation and formal implementation.

Pinto et al. (2009) conducted a study on information provided by Spanish university websites on their assessment and quality process. They analyze and evaluate the information provided by Spanish academic universities on the web about their assessment and quality processes with the aim of detecting aspects for improvement and identifying best practices in universities.

Rozic-Hristovski, Todorovski and Hristovski (1999) reported about developing a library website and included a guide to library services and resources.

3. Research Method

3.1 Introduction

It is important that for any type of research, the first step is to design the methodology to carry out research in a systematic manner without many hindrances. It helps the researcher to bring out the research in a systematic way. This chapter deals with the Research Design which includes methodology, data collection and operational definitions of key concepts and limitations of the study.

3.2 Method of Data Collection

To accomplish the objectives of the research, a data sheet was designed to collect data from the Academic Library websites of Tamil Nadu and Pondicherry. It included questions on the facets such as Quality of Website Design, Quality of Information Accuracy, Current Information, Extensive Coverage of Information, Content Analysis and Resources Availability. All the websites of the selected Library were browsed and recorded the data in the data sheet. The data sheet used for data collection is provided in Table 3.1.

3.3 Scope and Limitations

There are more 35 Academic Universities in Tamil Nadu and Pondicherry. Among these, 7 were selected as the rest of the Libraries do not have proper websites. Due to time constraints, the end users could not be consulted for their feedback about the Libraries. The study was completed only based on the secondary data.

4. Findings, Suggestions and Conclusion

4.1 Findings

The study on the evaluation of selected academic library websites of Tamil Nadu and Puducherry led to the following major findings:

- With regard to quality of websites, 75% of the websites were found to be up to the expectations while the remaining 25% was found to be Below Average or Poor.
- With regard to Information Accuracy, 80% of the websites were found to be up to the expectations (Extremely Good, Very Good and Good) while the remaining 20% was found to be Below Average or Poor.
- With regard to Currency of Information, 80% of the websites were found to be up to expectations (Extremely Good, Very Good and Good) while remaining 20% was found to be Below Average or Poor.
- With regard to Coverage of Information, 85% of the websites were found to be up to expectations (Extremely Good, Very Good and Good) while the remaining 15% was found to be Below Average or Poor.
- With regard to Content Analysis 80% of the websites were found to be up to expectations (Extremely Good, Very Good and Good) while the remaining 20% was found to be Below Average or Poor.
- With regard to Resources Availability 65% of the websites were found to be up to expectations (Extremely Good, Very Good and Good) while remaining 35% was found to be Below Average and Poor.
- Pondicherry University Library website was up to 100% of the expectations in terms of Resources Availability followed by Extensive Coverage of Information(85%), Website Design quality(85%), Content Analysis (60%), Information Accuracy (50%) and Currency of Information (25%). On the other hand, 75% was found to be Below Average or Poor in terms of Website Design followed by Currency of Information followed by Accuracy of Information (50%), Content Analysis (40%), Coverage of Information (15%), Website Design quality (15%).
- Central University of Tamil Nadu Library website was up to the satisfaction of 50 percent in terms of Currency Information followed by Extensive in the Coverage Information (40%), Content Analysis(40%), Website design quality(38%), Resources Availability (20%) And Information Accuracy (15%). On the other hand, 80% was found to be Below Average or Poor in terms of Resources Availability followed by Website Design Quality (62%), Extensive in the Coverage Information (60%), Content Analysis (60%) and Currency Information (50%).
- Madurai Kamaraj University Library website was up to the expectations (100%) in terms of Website design Quality followed by Extensive Coverage of Information (80%), Information Accuracy of the Website (50%), Resources Availability (50%), Content Analysis (40%) And Currency of Information (25%). On the other hand, 75% was found to be Below Average or Poor in terms of Currency of Information followed by Content Analysis (60%), Resources Availability (50%), Information Accuracy (50%), Extensive Coverage of Information

(20%).

- Periyar University Library website was up to the expectations in terms of Website design Quality with 100 percent followed by Resources Availability (80%), Extensive in the Coverage of Information (60%), Content Analysis (50%), Information Accuracy (50%). On the other hand, 100% was found to be Below Average or Poor in terms of Currency of Information followed by Information Accuracy (50%), Content Analysis (50%), Extensive Coverage of Information (40%), Resources Availability (20%).
- B.S. Abdur Rahman University Library website was up to the expectations in terms of Website design Quality with 90 percent followed by Content Analysis (80%), Information Accuracy (75%), Extensive in the Coverage of Information (70%), Resources Availability (60%). On the other hand, 100% was found to be Below Average or Poor in terms of Currency of Information followed by Resources Availability (40%), Extensive Coverage of Information (30%), Information Accuracy (25%), Content Analysis (20%) and Website design Quality (10%).
- Alagappa University library website was up to the expectations with 70 percent in terms of Website Design Quality followed by Extensive Coverage of Information (65%), Information Accuracy in the website (25%), Currency of Information (25%), Content Analysis (20%). On the other hand, 100% was found to be Below Average or Poor in terms of Resources Availability followed by Content Analysis (80%), Currency of Information (75%), Information Accuracy in the website (75%), Extensive Coverage of Information (35%) And Website Design Quality (30%).
- Bharathidasan University Library Website (85%) was up to the expectations in terms of Resources Availability followed by Extensive Coverage of Information (60%), Website Design Quality (50%), Currency of Information (50%), Content Analysis (40%), and Information Accuracy in the Website (25%). On the other hand, 75% was found to be Below Average or Poor in terms of Information Accuracy in the website followed by Content Analysis (60%), Currency of Information (50%), Website design Quality (50%), Extensive Coverage of Information (40%) and Resources Availability (15%).

4.2 Suggestions

Based on the outcomes of the study, the following is suggested for betterment of the Academic Library websites:

- ✓ The colors and structure of the websites can be enhanced for making the sites more useful and interactive.
- ✓ FAQ service can be included in some of the websites for making the beginners aware of the contents available on the websites.
- ✓ Navigation facility can be made easier with active links.
- ✓ Some websites need to keep the current information up-to-date, old information links should not be deactivated so that the users/students can avail the information at anytime according to their convenience.

4.3 Conclusion

This study has examined selected academic library websites of Tamil Nadu and Pondicherry concerning their approaches to e-information on their websites. This study, through self-evaluated data sheet has demonstrated academic library administrations perspectives and provided insights into developing e-information. Offering to evaluate e-information on the libraries' website accomplishes multiple goals including service, communication, education as well as improve user satisfaction. Academic libraries of various sizes and in different geographic areas can all take advantage of what e-resources have to offer to gain a competitive advantage. This studies of all libraries e-resources show that libraries should design action-driven websites by applying Website design quality, Information Accuracy, Currency of information, Extensive of the coverage information, Content analysis And Resources availability to conduct more core presenting them in a service-menu and on the user portal. There was significant demand for the provision of generic resources to support the education and administrative functions of information services. There is an overall lack of awareness as to what e-information resources and services already exist world-wide. Ultimately, the quality of education will be enhanced by engaging user/students through e-resources provided on academic library websites.

References:

1. Borlund, P. and Ingwersen, P. (1997), "The development of a method for the evaluation of interactive information retrieval systems", *The Journal of Documentation*, 53 (3), 225-50.
2. Burgoon, J.K., Bonito, J.A., Bengtsson, B., Cederberg, C., Lundeberg, M. and Allspach, L. (2000), "Interactivity in human-computer interaction: a study of credibility, understanding, and influence", *Computers in Human Behaviour*, 16(6), 553-74.
3. Granic, A. (2008), "Experience with usability evaluation of e-learning systems", *Universal Access in the Information Society*, 7(4), 209-21.
4. Halub, L.P. (1999), "The value of web-based library services at Cedars-Sinai health system", *Bulletin of the Medical Library Association*, 87(3), 256-60.
5. Kim, Y.-M. and Abbas, J. (2010), "Adoption of Library 2.0 functionalities by academic libraries and users: a knowledge management perspective", *The Journal of Academic Librarianship*, 36(3), 211-8.
6. Buchanan, S. and Salako, A. (2009), "Evaluating the usability and usefulness of a digital library", *Library Review*, 58 (9) 638-651.
7. Toleva, S.-S. (2010), "Evaluation of web-based information systems: users' informing criteria", *Issues in Information Science and Information Technology*, (7) 297-309.
8. Buchanan,s. and salako, A.(2009), "Evaluating the Usability and Usefulness of a Digital Library"Library review,58(9),638-651.
9. Raward, R (2001), "Academic Library Website Design Principles:Development of a Cheaklist",*Australian Academic & Research libraries*,32(2),123-136.
10. Tsakonas G and Papatheodorou C, (2006) Analysing and Evaluating Usefulness and Usability in Electronic Information services,journal of Information Services,Journal of Information science,32(5) 400-419.
11. Sasikala C, (2003) Evaluation of websites: A Study Processing of the 4th International

- Convention on Automation of Librarians in Education and Research (INFLIBNET,Ahmedabad) 1-12.
12. Lederman R.P.(1991) Content Analysis of word texts.MCN,The American Journal of Material child Nurshing 16,169.
13. B.Ramesh Babu,A.M.Narendra Kumar & S.Gopalkrishnan(2009):Credibility of University websites in Tamilnadu, DESIDOC Journal of Lib.& Inf.Tech. 29(3)..16-29.
14. Wilson,D.E. Web Content And Design trends of Alabama Academic Libraries,The Electronic Library,2015, 33(1),88-102.
15. Blummer,B.A. (2007) A Literature Review of Academic Library Web page studies, J. of Web Lib., 1(1),45-82.
16. Skukla,A.& Tripathi,(2010)A Establishing content awareness evaluation criteria for library website:A case study of Indian Academic library websites.Annals of Lib. And Inf. Stu.,57(4),403-441.
17. Rozic-Hristovski A,Todorovski L and Hristovski D, (1999) Developing a medical library website at the university of Ljubljana,Solovenia program,33(4) 313-325.
18. Head A.J., (1999) Web redemption and the promise of usability,online,23(6) 20-23. Ficher D, Head start (2000): Usability testing up front,online,24(1) 79-81.
19. Connell R.S.(2008) Survey of Web Developers in Academic Libraries .The journal of Academic Librarianship,34(2),121-129.
20. Chao H, (2002) Assessing the quality of academic libraries on the web: The development and testing of criteria, Library and Information Science Research (24),169-194.
21. Rogers, R., & Preston H. (2009) Usability Analysis for redesign of a Caribbean Academic Library Website: A case study OCLC System & Service.25(3) 2000-11.
22. Tobin,T.,& Kesselman, M.(2000) Evaluation of Web-based library instruction programs.Inspel,34(2),67-75.
23. Battleson,B.,Booth,A,& Weintrop.J.(2001).Usability testing of an Academic Library Website:A case study :The journal of Academic librarianship,27(3),188-198.
24. Pinto,M.,Guerero,D & Fernandez-ramos, (2009). A.Information Provided by Spanish University Websites on their assessment and quality process 8 (1),265-289.
25. Zaphirs,P. & Ellis,R.D.(2001).Website Usability and Content Accessibility of the top USA Universities .Procesedings of WebNet 2001 Conference,October 23-27.Orlando.FL.
26. Mangala. Anil Hirwade, (2005). Websites of Indian Universites: An evalution, Himalaya Publishing house, Bombay
27. Karp. T. & Karp, (1998). M. Art and the zen of websites. <http://www.tk-systems.com> (Accessed on 08 March, 2017).
28. Website optimization: Maximum Website performance, <http://www.websiteoptimization.com> (Accessed on 17 April,2017).
29. https://en.wikipedia.org/wiki/Library_website