WEBSITES OF RESEARCH AND DEVELOPMENT INSTITUTIONS IN INDIA: A WEBOMETRIC STUDY

Joicy A.J

MLIS Student

Dept. of Lib and Info. Sc.

Pondicherry University, Puducherry- 605014

srjoicelitfcc@gmail.com

Dr. Rekha Rani Varghese

Assistant professor

Dept. of Lib and Info. Sc.

Pondicherry University, Puducherry- 605014

rekhatvm@gmail.com

ABSTRACT

The websites of Research and Development institutions have now emerged as the prime source of information regarding the institutions. Since website portal is an inseparable component of a Research and Development institutions, the websites of R & D institutions provide due importance to the library content / information on their homepage. Also the institution websites provide access to a lot of electronic content. Since this is the situation worldwide, the present study is an attempt to evaluate how the R & D Institutions in India present their content in the websites. Out of the 246 Research and Development institutions identified from the website http://www.indiaedu.com/research-institutes/research-institutes-india.html, 77 (31.30 per cent) properly functioning websites were analyzed. The study revealed that majority of the Research and Development institutions in India provide informative links to contacts, copyright, news and events, RTI and history. A few websites provide opportunity for user interaction in the form of feedback. It is also found that majority of the research and development institutions websites are good to navigate and find information.

Key Words: Research and Development Institution, Webometrics

1.   Introduction

The tradition of Science and Technology (S & T) in India is over 5,000 years old. By maximizing the power of technology, India can strengthen the quality and affordability of our health care, advance climate- friendly energy development and deployment, and improve

education throughout the country. Thus it should be into the mainstream of economic planning in the sectors of agriculture, industry and services. Intellectual capital is known to be the prime mover of economic activity. The dominance by the West and the rise of Asian countries like Japan and Korea can directly be related to the excellence in innovation, technological up gradation and research and development. India's emergence as a global R&D hub is a process that began more than a decade ago. Realizing the promise and potential that India has to offer in the field of R&D, FICCI instituted a special wing dedicated to this sector.

The World Wide Web has revolutionized the communication scenario around the globe. The websites of Research and Development institutions have now emerged as the prime source of information regarding the institutions. Since website portal is an inseparable component of a Research and Development institution, the websites of R & D institutions provide due importance to the library content / information in their homepage. Also the institution websites/ web pages provide access to a lot of electronic content. Since this is the situation worldwide, the present study is an attempt to evaluate how the R & D Institutions in India present their content in their websites. The academic institutions in India, in particular the Research and Development institutions of today, are reaching to a new conquest by improving their service base especially with application of Information Technology for access and delivery of e-content to their clients. In this process they are also adapting to the change, altering their image, by executing new functions and providing varieties of services in an evolving continuum. The vast majority of institutions services are now Web-enabled and so attention is being focused on designing user-friendly and easily managed and maintained institutions websites. The present study attempts to evaluate the websites of the R&D institutions in India.

2.   Related Studies

Research is very important for generating new knowledge in any field and India, being one of the fastest growing economies of the world, has put lots of importance on research and development. Several studies have been conducted on website evaluation in India and abroad. Konnur & Rajani (2010) examined that webometric studies are researching to a new conquest by improving their service base especially with application of Information technology for access and delivery of e-content to their clients.   Archana (2010) made an attempt to understand and analyze the presence and presentation of libraries of Engineering Colleges (EC) in Kerala in their respective websites, and found that websites of academic

institutions are the prime sources of information about the institution. Libraries, being the main provider of information for the academics, need to be represented in the respective homepages with due importance but it is observed that even the highest scoring libraries satisfy only half of the criteria listed for analysis. It is high time for the library professionals associated with these institutions to be serious about the role of library websites in providing marketing and quality services. A recent study by (2009) Tucciarone found that students rely on information from college websites for evaluating the institution. A University's website now is an important tool in the information gathering stage in the consumer decision making process. Potential student's first impressions are influenced electronically via the website.

3.   Objectives

The major objectives of the study are:

1. To find out the services and facilities provided on the Research and Development institutions websites in India.

2. To examine the design and usability of the websites of R & D institutions in India.

3. To investigate the user services and currency of information provided by the Research and Development institutions websites in India.

4. To examine the application of Web 2.0 technologies on the websites of R & D institutions in India.

4.   Methodology

The population of the study was the websites of the Research and Development institutions in India. The list of the R & D institutions was identified from the website http://www.indiaedu.com/research-institutes/research-institutes-india.html. Out of the 246 Research and Development institutions, 77 (31.30 per cent) properly functioning websites were analyzed. The data collection was carried out during the period 11th March 2011 to 10th April 2011.

5.   Analysis and Interpretation

5.1   General Information

Table 1 shows the general information given in the websites of Research and Development institutions in India. General information includes history, location, sitemap, news & events and RTI. Analysis shows that nearly 80.52 percent of the Research and Development institutions websites in India provide history on their websites. Majority (80.52 percent) of the institutions offers their news and events and about 72.72 percent of them have given information about RTI on their website. Nearly 67.53 percent of the websites provide

details about their location and 51.95 percent of them make available their sitemap on the website.

Table 1

General Information

General Information	Yes	No	Total
History	62 (80.52%)	15 (19.48%)	77 (100%)
Location	52 (67.53%)	25 (32.47%)	77 (100%)
News and Events	62 (80.52%)	15 (19.48%)	77 (100%)
RTI	56 (72.72%)	21 (27.27%)	77 (100%)
Sitemap	40 (51.95%)	37 (48.05%)	77 (100%)

5.2   Domain wise Analysis of R&D Institutions Websites

Domain wise analysis of R&D institutions websites in India were carried out and the results are given in Table 2. Analysis shows that a good number (40.26 per cent) of websites have .org domain followed by .res (28.57 per cent). Only a very few institutions (5.19 per cent) are having .gov domain. Nearly 25.78 percent of the Research and Development institutions are using different domains (.nic, .ac, .co, .in, .edu and ernet).

Table 2
General Information

Domain	Number	Percentage
.org	31	40.26
.res	22	28.57
.gov	4	5.19
Others	20	25.78
Total	**77**	**100**

5.3.   Content wise Analysis of R&D Institutions Websites

Table 3 shows the content wise analysis of the websites of Research and Development institutions in India. Analysis reveals that a good number (49.35 per cent) of the institutions websites provide very good information about their activities, while 20.78 per

cent of them contain poor information about administrative activities. About 64.94 per cent of the websites contain very good information about library. Nearly 64.94 per cent of the Research and Development institutions websites contain very good search tool. Majority (61.04 per cent) of them has included staff details in a very good manner. Majority of the Research and Development institutions not provide much information on mission statement (51.95 per cent) and multimedia (54.55 per cent) contents. A good number (46.75 per cent) of the Research and Development institutions offer detailed information about their research projects.

Table 3

Content wise Analysis of R&D Institutions Websites

Contents	Very Good	Good	Average	Poor	Total
Administrative Activities	38 (49.35%)	20 (25.97%)	3 (3.90%)	16 (20.78%)	77 (100%)
Information about Library	50 (64.94%)	4 (5.19%)	2 (2.60%)	21 (27.27%)	77 (100%)
Mission Statement	28 (36.36%)	8 (10.39%)	1 (1.30%)	40 (51.95%)	77 (100%)
Multimedia	22 (28.57%)	11 (14.29%)	2 (2.60%)	42 (54.55%)	77 (100%)
Research Projects	36 (46.75%)	22 (28.57%)	4 (5.19%)	15 (19.48%)	77 (100%)
Search Tool	50 (64.94%)	4 (5.19%)	1 (1.30%)	22 (28.57%)	77 (100%)
Staff Details	47 (61.04%)	8 (10.39%)	3 (3.90%)	19 (24.68%)	77 (100%)

6.4   Format wise Analysis of R&D Institutions Websites

From Table 4 it is clear that nearly half (48.05 per cent) of the Research and Development institutions websites contains very good colours. Majority (51.95 per cent) of them included figures and tables on their websites. About half (49.35 per cent) of the Research and Development institutions websites have very good font size and readability. Nearly 48.05 per cent of them contain very good text format (simple, concise, clear) and text sequence on their websites.

Table 4

Format wise Analysis of R&D Institutions Websites

Format	Very Good	Good	Average	Poor	Total
Colour	37 (48.05%)	30 (38.96%)	6 (7.79%)	4 (5.19%)	77 (100%)
Figures and Tables	40 (51.95%)	26 (33.77%)	6 (7.79%)	5 (6.49%)	77 (100%)
Font Size	38 (49.35%)	30 (38.96%)	4 (5.19%)	5 (6.49%)	77 (100%)
Readability	38 (49.35%)	27 (35.06%)	6 (7.79%)	6 (7.79%)	77 (100%)
Sequence	37 (48.05%)	29 (37.66%)	6 (7.79%)	5 (6.49%)	77 (100%)
Text(simple, concise, clear)	37 (48.05%)	29 (37.66%)	6 (7.79%)	5 (6.49%)	77 (100%)

6.5   Responsibility wise Analysis of R&D Institutions Websites

Table 5 shows the responsibility wise analysis of the websites of Research and Development institutions in India. Analysis reveals that majority (62.34 per cent) of the Research and Development institutions contain statement of responsibility. Most of the websites have phone number (97.40 percent), Fax (97.40 percent), Postal Address (98.70 percent) and E-mail address (89.61 percent). Nearly 72.72 per cent of the Research and Development institutions contain copyright information

Table 5

Responsibility wise Analysis of R&D Institutions Websites

Responsibility		Yes	No	Total
Statement of responsibility		48 (62.34%)	29 (37.66%)	77 (100%)
Contact Address	**Phone**	75 (97.40%)	2 (2.60%)	77 (100%)
	Fax	75 (97.40%)	2 (2.60%)	77 (100%)
	Postal Address	76 (98.70%)	1 (1.30%)	77 (100%)
	E-mail	69 (89.61%)	8 (10.39%)	77 (100%)
Copyright		56 (72.72%)	21 (27.27%)	77 (100%)

6.6   Currency of Information

Currency of the information provided on the websites of Research and Development institutions in India are analyzed and given in Table 6. Analysis reveals that majority (77.92 percent) of the Research and Development institutions provide their current news on their websites. Nearly 49.35 per cent of the websites have last date of updation on their websites.

Table 6

Currency of Information wise Analysis of R&D Institutions Websites

Currency of Information	Yes	No	Total
Current News	60 (77.92%)	17 (22.08%)	77 (100%)
Date of Updation	38 (49.35%)	39 (50.64%)	77 (100%)

6.7   User Services wise Analysis of R&D Institutions Websites

Different user services provided by Research and Development institutions websites in India were analyzed and given in Table 7. Analysis shows that majority (76.62 per cent) of the Research and Development institutions have no provision for FAQ (Frequently Asked Questions) on their websites. Nearly 55.84 per cent of them have no help screens, but a good number (44.16 per cent) of them have help screens to assist users. Majority (50.65 per cent) of the institutions has the provision to ask questions on their websites.

Table 7

User Services wise Analysis of R&D Institutions Websites

User Services	Yes	No	Total
FAQ	18 (19.48%)	59 (76.62%)	**77 (100%)**
Help Screens	34 (44.16%)	43 (55.84%)	**77 (100%)**
Possible to Ask Questions	39 (50.65%)	38 (49.35%)	**77 (100%)**

6.8   Links wise Analysis of R&D Institutions Websites

Table 8 shows that large majority (90.90 per cent) of the Research and Development institutions websites have at least one link on every page. Nearly 91 per cent of the institutions web pages have links to home page. Large majority (94.80 percent) of them have links to other websites also.

Table 8

Links wise Analysis of R&D Institutions Websites

Links	Yes	No	Total
At Least One Link on Every Page	70 (90.90%)	7 (9.09%)	77 (100%)
Links to Home Page	70 (90.90%)	7 (9.09%)	77 (100%)
Other Links	73 (94.80%)	4 (5.19%)	77 (100%)

6.9   Usability wise Analysis of R&D Institutions Websites

Usability of the websites is depends on some factors such as easy to navigate, easy to find information, any confusing information and easier to use. The usability of Research and Development institutions websites is analyzed and represented in Table 9.

Table 9

Usability wise Analysis of R&D Institutions Websites

Usability	Very Good	Good	Average	No	Total
Easy to Navigate	19 (24.68%)	51 (66.23%)	7 (9.1%)	-	77 (100%)
Easy to Find Information	19 (24.68%)	51 (66.23%)	7 (9.1%)	-	77 (100%)
Any Confusing Information	-	-	3 (3. 90%)	74 (96.10%)	77 (100%)
Easier to Use	19 (24.68%)	49 (63.64%)	9 (11.69%)	-	77 (100%)

Analysis shows that majority (66.23 per cent) of the Research and Development institutions websites are good to navigate and find information. Nearly 63.64 per cent of the websites are easy to use. Most (96.10 per cent) of the sites have no confusing information.

6.10   Design wise Analysis of R&D Institutions Websites

Table 10 shows the design wise analysis of the websites of Research and Development institutions in India. Analysis reveals that majority (54.55 per cent) of the websites have a very good look and feel. Nearly 57.14 per cent of the websites contents are very good. Majority of the websites fit on the computer screen (70.13 per cent) and excellently load websites on the computer (49.35 per cent). About 53.25 per cent of the websites play Video/Audio in a very good manner.

Table 10

Design wise Analysis of R&D Institutions Websites

Design	Excellent	Very Good	Average	Poor	Total
Overall Look and Feel	26 (33.77%)	42 (54.55%)	9 (11.69%)	-	**77 (100%)**
Overall Content	22 (28.57%)	44 (57.14%)	9 (11.69%)	2 (2.59%)	**77 (100%)**
Website Fit on Computer Screen	14 (18.18%)	54 (70.13%)	8 (10.39%)	1 (1.30%)	**77 (100%)**
Website Load Properly on Computer	38 (49.35%)	32 (41.56%)	6 (7.79%)	1 (1.30%)	**77 (100%)**
Video and/or Audio Play as Expected	24 (31.16%)	41 (53.25%)	8 (10.39%)	4 (5.19%)	**77 (100%)**

6.11   Web 2.0 Application wise Analysis of R&D Institutions Websites

The investigator assessed the extent of use of web2.0 technologies on the websites of Research and Development institutions in India and given in Table 11. Analysis shows that most of the R&D institutions in India are not using Web 2.0 application such as RSS feeds and ATOM Index. A very few (2.60 per cent) Research and Development institutions have subscribed RSS feeds in their websites.

Table 11

Web 2.0 application wise Analysis of R&D Institutions Websites

Web 2.0	Yes	No	Total
RSS	2 (2.60%)	75 (97.40%)	77 (100%)
Atom Index	-	77 (100%)	77 (100%)

7.   Findings

The present investigation has achieved its objectives and it provides valuable information about the websites of Research and Development institutions in India. The major findings of the study are the following.

1. Out of the 246 Research and Development institutions in India, only 109 institutions have websites. Out of 109 websites, 77 websites are functioning properly.

2. A good number (40.26 per cent) of Research and Development institutions websites in India have .org domain followed by .res (28.57 per cent).

3. Majority of the websites contain very good search tool, figures and tables on their websites.

4. Most of the websites have phone number (97.40 percent), Fax (97.40 percent), Postal Address (98.70 percent) and E-mail address (89.61 percent). Majority of them contain copyright information (72.72 per cent) and statement of responsibility (62.34 per cent).

5. Majority (77.92 percent) of the research and development institutions provide their current news on their websites. Nearly 49.35 per cent of the websites have last date of updation on their websites.

6. More than half of the institutions have the provision to ask questions and a good number of them have help screens to assist users.

7. Large majority (90.90 per cent) of the research and development institutions websites has at least one link on every page and each page has links to home page. Most of them have links to other websites.

8. Regarding usability, majority (66.23 per cent) of the research and development institutions websites are good to navigate and find information. Nearly 63.64 per cent of the websites are easy to use. Most (96.10 per cent) of the sites have no confusing information.

9. Majority (54.55 per cent) of the websites have a very good look and feel. Majority of the websites fit on the computer screen and excellently load websites on the computer.

10. Most of the R&D institutions in India are not using Web 2.0 applications such as RSS feeds and ATOM Index. A very few (2.60 per cent) research and development institutions have subscribed RSS in their websites

8.   Discussion

The study revealed that majority of the Research and Development institutions in India provide informative links to contacts, copyright, news and events, RTI, history. A few

websites provide opportunity for user interaction in the form of feedback. A few websites provide links to mission statement, date-of- update. A good number of the Research and Development institutions provide their location and sitemap in their websites. This is a very useful feature for quick access of pages on lower levels of the website. About half of the libraries provide some information on their search tool of the site and information about library in their websites. Some of the websites are not well-structured and some of the websites have dead links. The websites should be well-structured and attractive and should offer a wide range of information. The correct use of title can produce improved results.

The websites should avoid arranging text over the whole width of the screen and should divide long texts into smaller sections. The texts should be large enough so that visitors can read it easily. The background color should be in contrast to the text color so that it doesn't obscure anything. It's a good practice to use web safe colors like a white on black or black on white combination for text colors and avoid animations and moving text. The Research and Development institutions websites should avoid using banners and images that take long time to load their websites. Instead use relevant images that have been optimized appropriately.

It is found that all the websites provide lists of links. A good number of the websites have search facility and links to other websites. The websites should provide simple and advanced searching facilities. The websites should limit the links included in a text and should provide links to as many documents as possible online. The websites should include links to the homepage and to every WebPages of the site so that visitors can navigate through the site with ease. The links should be clearly identified and point towards the right destination. The institutions should ensure that the websites 'navigation is easy to use and consistent.

All the institutions provide information about their services on their websites. A few institutions give details of the services to researchers in their websites. It is revealed that only two websites have deployed one or two web 2.0 technologies and among the web 2.0 technologies deployed by the websites, RSS is the most used service. The institutions should provide a collaborative forum for discussion and sharing of information for library users. The institutions should use web2.0 applications such as RSS. The Research and Development institutions websites should exploit the emerging Internet technologies to attract and increase their users.

9.   Conclusion

This study gives an informative preview of the contents and design of Research and Development institutions websites in India. Although the Research and Development institutions have a web presence and varying levels of services, there is enormous scope for improving the websites. Most of the web users visit the best and highly rated sites in the world. If a Research and Development institutions website is more attractive and informative, it can easily capture the attention of library users and web surfers.

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