Awareness on Web Environment in the Context of Digital Library among LIS Professionals in Chennai, India

Dr. S. BALAMURUGAN
Librarian
Knowledge Resource Center, GITAM University
Bengaluru Campus
India
Dr. D. GNANASEKARAN
Librarian
Anand Institute of Higher Technology, Chennai
India

Abstract:

This study attempts to identify the awareness on web environment in the context of digital library among the library professionals in and around Chennai. Web environment comprises of variables such as browsers, domains, internet security, internet threat, internet usage, resource identifiers and search engines. The empirical data were collected, through questionnaire method among 525 LIS professionals working in 348 institutions of different domains such as medical, engineering, arts & science and polytechnic, of which 432 (82.29%) were responded. Out of 432 responded, 62.5% are male; 37.5% are female; 30.75% are arts and sciences; 36.80% are engineering; 20.60% are medical and 11.80% are polytechnic institutions. This study identifies the list of factors that are essential for implementing the digital library in the web environment. The level of awareness on the web environment factors such as browser, domain, internet security, internet threat, internet usage, resource identifiers and search engines has been identified. The aware are identified by self appraisal on a four point scale such as no skill, learning, familiar and proficient. Majority of the users are familiar of browsers, search engines and information security.

Key words: Browsers, search engines, internet threat, internet security.

1. Introduction

Technologies have created a new service environment in every sphere of activities and have pushed conventional boundaries of all the organisations especially in libraries and information centres much farther with the risk and opportunities. This technology in combination with communication tools and information procedures facilitated in generation, acquisition, storage, organisation, searching, retrieval and transformation of information using electronic means. These electronic information sources, used initially to transport textual information, today transports other form of information such as images, videos, and audios. These electronic sources, initially served for specialised clients, now accessed by a wide range of users, ranging from computer specialists, discipline experts, laymen including the novice computer users and students at all levels. This trend has created an emerging important environment namely web environment. The web environment comprises of awareness on browsers, domains, internet security, internet threat, internet usage, resource identifiers and search engines.

Lack of needed investment and infrastructure as two main challenges affecting the development of digital libraries, as also emphasised by Isfandyari-Moghaddam and Bayat (2008), one of the vital elements for the success and dynamism of digital libraries is specialised human resources, namely library staff or librarians. They declared that, in order to meet job requirements of digital libraries totally, librarians should have or acquire skills such as ability to formulate search strategies, know how to evaluate websites, be able to guide and educate users, understand how to integrate network resources, ability to catalogue and organise digital information,

understand visualisation and digitisation technologies, be able to design user interfaces and portals, knowledge of the analysis and interpretation of information, project management, OCR (optical character recognition), awareness of mark-up languages such as SGML, HTML and specially XML, indexing and abstracting, technologies of databases, programming, web technology, familiarity with web search tools, management of e-publications, information architecture (IA), Information literacy (plus literacy of computers and networks), metadata and e-metrics and evaluation methods of digital libraries.

2. Abbreviations Used

DL	-	Digital Library
F	-	Familiar
Fq	-	Frequency
L	-	Learning
M	-	Mean
NS	-	No Skill
P	-	Preference
P	-	Proficient
SD	-	Standard Deviation
URL	-	Universal Resource Locator
URN	-	Universal Resource Number
URI	-	Universal Resource Identifier

3. Related Studies

The information technology (IT), has become part of everyday life, Dolan & Schumacher (1997) emphasized, the influx of the internet and innovative technologies impacted the LIS professionals that they enable to be qualified in a new variety of technological career. Spink & Cool (1999) studied curricula required to educate information professionals working in a digital library environment, and they stated that "We do not

know what knowledge is required to produce information or computer professionals to work as digital librarians, digital developers, or in other job categories, or even what the job designations or requirements will be in the future."

Kwasik (2002) studied the technological change connecting with serials librarians and indicated that the skills that could be fitted to a digital environment, for instance knowledge of metadata standards, markup languages, experience in cataloguing electronic publications and Web design, etc. were normally rated as "knowledge" desired for an information professional.

Tennant (1999) presented a list of discipline-specific knowledge which the digital librarians should know and be qualified in. The vital skills needed to create and manage digital library collections and services namely imaging technologies, optical character recognition (OCR), markup languages, including HTML, SGML, and XML, cataloging and metadata, indexing and database technology, user interface design, programming, Web technology and project management.

Sreenivasulu (2000) considered that an essential role of a professional in digital libraries has to play a liaison role to bring together users and information. Additionally, one of the essential skills which the digital librarian needed to develop is the ability to manage digital libraries and digital knowledge in terms of digital knowledge management. However, there is not indication of any list of personal characteristics, the specific skills needed for working as digital information professional were knowledge of Web publishing, imaging technologies, optical character recognition and markup languages.

Digital libraries, as Kavulya (2007) stated, are becoming prevalent worldwide and there is no doubt that the future of knowledge creation and information sharing lies in electronic networks which are mainly concerned with information gathering, accumulation of information, organising

knowledge and information in digital form and that they are efficient and cost-effective in delivering information.

Fast and Campbell (2004), who compared the perceptions and expectations of university students for searching the web and library databases, put it as web searching is shaping user expectations of what an information retrieval system looks like, how it behaves, and how to interact with it. Novotny (2004) examined the use of an online catalogue by "web-savvy" student users. Xia (2003) examined perceptions and expectations of user communities and librarians in a New Zealand academic library.

Griffiths and Brophy (2005), suggests that Internet search engines totally dominate the searching practice of UK students, with 45 per cent using Google regularly, as against 10 per cent using online library catalogues. The rationale for this is that search engines are perceived to offer ease of use, familiarity and reliability.

Brophy and Bawden (2005), who indicates that an improvement in searching skills brings better results from library databases, but not from internet search engines. The authors further suggests that the two kinds of system are complementary, offering different kinds of information, is likely to be less important to most users than the evident fact that search engines can be used to good effect with minimal, or no training.

Griffiths and Brophy (2005), from a basis of detailed analyses of students' searching behaviour, conclude that student's use of search engines, now influences their perception and expectation of other electronic resources. Students' use of resources is now very coloured by their experience with search engines, which in turn may lead to expectations that may not be realistic for different types of services.

Fast and Campbell (2004) report that student expectations of an OPAC were "modest", whereas expectations of web search through Google were "high", though this seems to

have largely related to ease of use, and accessibility of documents. There seems little doubt that expectations of a "full" digital library, especially as compared with a traditional library, tend to overestimate what may be achieved.

After reviewing the texts related to the DLs, such as the works of Marion (2001), Deegan and Tanner (2002), Bawden et al. (2005), and Zhou (2005), it is concluded that to play an effective and better role in the development and management of DLs, digital librarians should achieve a variety of skills such as search strategy formulation, awareness of web site accessibility issues, ability to supervise and teach users, understand the integrity of network sources, ability to classify and organise digital information, ability to visualise and digitise "objects", designing links and portals for users, discussing and interpreting information, project management, abstracting, be familiar with markup languages such as HTML, SGML and XML, the technologies of databases, programming, web technologies, information architecture and web search tools. Therefore this study identified the level of awareness and the resources used for acquiring the knowledge by LIS professionals.

4. Objectives

The major objectives of the study are
- To identify the list of factors those are essential for implementing and maintaining the digital library in web environment.
- To identify the opinion on priority of various factors on web environment in the context of digital library among LIS professionals.
- To identify the awareness on browsers and search engines among the professionals.
- To identify the awareness on internet security and threats among the professionals.

- To identify the source of awareness on various web environment based factors.

5. Hypotheses

The following hypotheses were formed based on the objectives.
- The library professionals has fair amount of knowledge on the concept of web environment, in relation to digital libraries.
- The levels of awareness on the conceptual knowledge on various factors of web environment were identical among the library professionals irrespective of Gender, designation and experience
- The level of awareness on browsers and search engines were identical among the library professionals irrespective of gender, designation and experience.
- There is a significant difference in the source of awareness on web environment based factors among the professionals.

6. Methodology

The awareness on web environment in digital library activities among the LIS professionals have been identified through self appraisal method. The data were collected from the LIS professionals using structured questionnaire. The LIS professionals working in various higher educational institutions in and around Chennai were asked to mark their level of awareness in a four point scale such as *'no skill', 'learning', 'familiar'* and *'proficient'*. The data thus collected through the self appraisal questionnaire has been analysed and interpreted using the statistical tools and techniques.

The questionnaires were distributed among all the LIS professionals working in these 348 higher educational institutions situated in and around Chennai. Out of 525

distributed, 432 were responded, and the response rate is 82.29%.

The institutions were grouped based on their domain as Arts and Sciences, Engineering and Technology, Medical Sciences and Polytechnic based on their nature of management. The demographic data of the respondents are shown in Table 1.

Table 1 Demographic data about Respondents

Description	Fq	%
Gender		
Male	270	62.5
Female	162	37.5
Designation		
Librarian	257	59.5
Asst. Librarian	175	40.5
Experience		
5 and Below	104	24.1
6-10	143	33.1
11-15	133	30.8
Above 15	52	12.0
Domain		
Arts and Science	133	30.8
Engg. & Tech.	159	36.8
Medical Sciences	89	20.6
Polytechnic	51	11.8

Out of 432 respondents, 62.5% of respondents are male and 37.5% are female. It is also seen that 59.5% of respondents are librarians and 40.5% are assistant librarians. 24.1% of professionals are having experience of below five years; 33.1% are between 6 to 10 years; 30.8% are between 11 to 15 years whereas only 12% are above 15 years of experience. 36.8% are working in Engineering and Technology institutions. 30.8% are working in Arts and Science. 20.6% working in Medical Sciences and 11.8% working in Polytechnic.

7. Awareness on Web Environment

Web environment comprises of several variables of which few of them are taken up for study and the same is shown in Table 2 along with examples.

Table 2 Variables on Web Environment

Variables	Examples
Browsers	Internet Explorer, Mozilla Firefox, Netscape, Opera, Safari, Google Chrome etc.
Domains	.com, .edu, .gov.in, ac.in, .org, .net etc.
Internet Security	Instruction detection system, port blocking, add blocking, parental control etc.
Internet Threats	Virus, spam, antivirus, spam guard, hacking, malware etc.
Internet Usage	Navigation in internet, use of search engine, meta search, use of Boolean operators, search options etc.
Resource Identifiers	URL, URI, URN etc.
Search Engines	Google, Yahoo, MSN, Altavista, Infoseek, Lycos etc.

The level of awareness on the above seven variables was measured from the respondents using four point scale such as 'no skill', 'learning', 'familiar' and 'proficient' through self appraisal method.   Mean and Standard Deviation were calculated based on the opinion. Ranks were provided base on the mean and standard deviation and the same is shown in Table 3.

Table 3 Web Environment

Description	NS		L		F		P		M	SD	P
	Fq	%	Fq	%	Fq	%	Fq	%			
Browsers	36	8.3	156	36.1	17	3.9	223	51.6	2.99	1.10	2
Domains	10	2.3	54	12.5	366	84.7	2	0.5	2.83	0.44	4
Internet security	15	3.5	87	20.1	176	40.7	154	35.6	3.09	0.83	1
Internet threats	274	63.4	132	30.6	10	2.3	16	3.7	1.46	0.71	7
Internet usage	10	2.3	15	3.5	401	92.8	6	1.4	2.93	0.37	3
Resource Identifiers	161	37.3	16	3.7	123	28.5	132	30.6	2.52	1.26	6
Search Engines	80	18.5	14	3.2	247	57.2	91	21.1	2.81	0.97	5

N=432

The mean lies between 1.46 and 3.09. Thus mean value of variables lies between learning and familiar except internet security and internet threats. The level of awareness is high in case of information security and it is further followed by browsers, internet usage and domains respectively. Internet threats and resources identifiers are least preferred factors. The standard deviation ranges between 0.51 to 1.26 which indicates that there exists no deviation on their opinion.

7.1. Web Environment Vs Gender

The analysis is further extended with the gender of the professionals. The mean, standard deviation and preferences are shown in Table 4.

Table 4 Web Environment Vs Gender

Description	Male			Female			D_SD
	M	SD	P	M	SD	P	
Browsers	2.94	1.088	2	3.06	1.124	2	-0.036
Domains	2.83	0.449	4	2.84	0.430	4	0.019
Internet security	3.10	0.834	1	3.06	0.828	1	0.006
Internet threats	1.48	0.745	7	1.44	0.677	7	0.068
Internet usage	2.91	0.385	3	2.97	0.342	3	0.043
Resource Identifiers	2.61	1.258	6	2.37	1.275	6	-0.017
Search Engines	2.82	0.953	5	2.79	1.012	5	-0.059

Figure 1 Web Environment Vs Gender
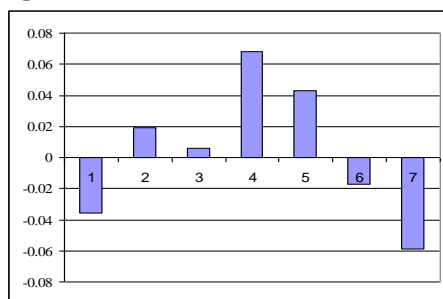
According to the preferences, there exists unanimous opinion between male and female on various web environment factors. The standard deviation ranges 0.385 to 1.258 in the case of male and it ranges between 0.342 and 1.275 on female. In order

to identify the deviation of opinion between male and female difference in deviation has been calculated between male and female standard deviation and the same is shown in Table 4 and Figure.1. The difference in opinion is more on male than female on domains, internet security, internet threats and internet usage. Whereas less on browsers, resource identifiers and search engines.

7.2 Web Environment Vs Designation

The analysis is further extended and compared with the designation of the professionals. The same is shown in Table 5.

Table 5 Web Environment Vs Designation

Description	Librarian			Asst. Librarian			D_SD
	M	SD	P	M	SD	P	
Browsers	2.914	1.097	2	3.10	1.102	2	-0.005
Domains	2.837	0.438	5	2.83	0.448	4	-0.01
Internet security	3.051	0.844	1	3.14	0.812	1	0.032
Internet threats	1.448	0.738	7	1.49	0.694	7	0.044
Internet usage	2.911	0.410	3	2.97	0.301	3	0.109
Resource Identifiers	2.572	1.273	6	2.45	1.262	6	0.011
Search Engines	2.844	0.935	4	2.75	1.030	5	-0.095

Figure 2 Web Environment Vs Designation
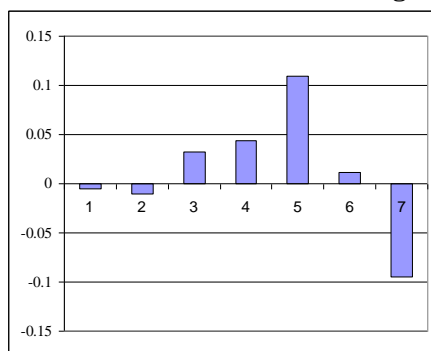
There exists uniform preference between librarian and asst. librarian on web environment factors such as internet security, browsers, internet usage, resource identifiers and internet

threat. However the preferences interchange between search engine and domain. The standard deviation ranges between 0.410 and 1.273 in the case of librarian whereas it ranges between 0.301 and 1.262 in asst. librarian. The deviation of opinion is less in the case of asst. librarian whereas it is little more on librarians. In order to identify the difference opinion between librarian and assistant librarian difference in standard deviation has been calculated and the same is shown in Table 5 and Figure 2.

7.3. Web Environment Vs Domain of the Institution

The analysis is further compared with the domain of the institution and the same is shown in table 6.

Table 6 Web Environment Vs Domain of the Institution

Description	Arts science	&		Engineering			Medical			Polytechnic		
	M	SD	P	M	SD	P	M	SD	P	M	SD	P
Browsers	2.99	1.15	2	3.05	1.06	2	2.97	1.13	2	2.82	1.07	4
Domains	2.87	0.34	4	2.84	0.48	4	2.76	0.50	5	2.82	0.43	5
Internet security	3.12	0.76	1	3.14	0.83	1	3.06	0.90	1	2.88	0.91	3
Internet threats	1.35	0.59	7	1.45	0.64	7	1.52	0.81	7	1.71	0.99	7
Internet usage	2.96	0.23	3	2.92	0.48	3	2.92	0.31	3	2.92	0.39	2
Resource Identifiers	2.55	1.29	6	2.53	1.25	6	2.43	1.25	6	2.59	1.34	6
Search Engines	2.78	0.96	5	2.74	0.97	5	2.83	0.98	4	3.06	1.01	1

There exists the unanimous preference on all factors between arts and science and engineering domain. The deviation opinion can be seen between medical and polytechnic. The ranges of preferences are identical between medical and polytechnic for three factors such as domain, resource identifiers and internet threat. It seems there exists difference on preference on browsers, internet security, internet usage and search engines. The order of preference on medical domain are internet security, browsers, internet usage and search engines. In the

case of polytechnic the order of preference are search engines, internet usage, internet security and browsers.

7.4. Web Environment Vs Experience

The analysis is further carried out with the experience of the professionals and the same is shown in Table 7.

Table 7 Web Environment Vs Experience

Description	Below 5 Yrs			6 to 10 Yrs			11 to 15 Yrs			Above 15 Yrs		
	M	SD	P	M	SD	P	M	SD	P	M	SD	P
Browsers	3.09	1.05	1	2.94	1.15	2	2.99	1.11	2	2.92	1.06	4
Domains	2.88	0.39	4	2.78	0.48	5	2.82	0.47	4	2.92	0.33	2
Internet security	2.99	0.88	2	3.02	0.88	1	3.20	0.77	1	3.17	0.73	1
Internet threats	1.55	0.86	7	1.45	0.75	7	1.46	0.62	7	1.35	0.56	7
Internet usage	2.94	0.34	3	2.91	0.43	4	2.97	0.24	3	2.88	0.51	5
Resource Identifiers	2.44	1.28	6	2.50	1.25	6	2.50	1.29	6	2.83	1.23	6
Search Engines	2.69	1.03	5	2.92	0.92	3	2.74	1.01	5	2.92	0.90	3

There exists unanimous preferences for resource identifiers, internet threat irrespective of year of experiences among LIS professionals and these two are identified as least preferences. In the case of browsers, the professionals who are having less experience are given first preference i.e. below and equal to 5 years whereas it is given second preference by others. In the case of internet security, the professionals with experience of less than 5 years are given second preference whereas experienced person provided first preference.

8. Findings

The respondents are well aware on information security, browsers, internet usage and domains respectively. Internet threats and resources identifiers are least preferred factors. There exists no significant deviation between genders.

The level of awareness seems to be high in case of internet security irrespective of designation of the respondents, followed by browsers, domains and internet usage. Least awareness is seen on internet threats irrespective of designation of the professionals.

The level of awareness on internet security seems to be high among the professionals belong to medical, engineering and art & science domains. Search engine is familiar among polytechnic professionals. Least awareness is seen among the professionals in internet threats irrespective of the domain of the institution.

The level of awareness on internet security is high irrespective of the experience of the professionals except professionals with below five years of experience. The level of awareness is same and ranked second in case of browsers among the professionals having above five years of experience. Least awareness is seen in case of internet threats irrespective of the experience of the professionals.

9. Conclusion

The digital libraries, here after will be shaped by the technologies, standards and models. The key dominating factors of the digital library will be the complexity of the information search process; the implicit nature of information and their use approach; difficulties in measuring the outcome of digital libraries and in adequate knowledge on information system, services, technological persee and user of digital library. This indicates that the digital libraries are trans disciplinary in nature which requires co-operation between developers, user, technocrats, academicians and policy making communities.

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About the Authors

Dr. S. BALAMURUGAN currently working as Librarian in GITAM University, Bengaluru, India. He obtained his M.L.I.Sc degree from Annamalai University and M.Phil degree from Alagappa University. He obtained his Doctorate from Anna University, Chennai. He has published more than 20 papers in national and international journals and seminar proceedings and edited volumes. Email: sbalamurugan06@gmail.com

Dr. D. GNANASEKARAN is currently serving as Librarian in Anand Institute of Higher Technology, Chennai, India. He has more than 10 years experience in various libraries. He obtained B.L.I.S and M.L.I.S degrees from Annamalai University, M.Phil degree from Alagappa University and Ph.D. from Bharathiar University. He has published about 25 papers in peer reviewed national and international journals, festschrifts and conference proceedings. Email: gsekard@gmail.com