Level of Awareness on Digitisation Trends and Techniques among LIS Professionals in and around Chennai, Tamil Nadu: An Empirical Study

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Abstract - **This study attempts to identify the awareness on digitisation trends and techniques among the library professionals in and around Chennai. The empirical data were collected, through questionnaire method among 540 LIS professionals working in 348 institutions of different domains such as Medical, Engineering, Arts & Science and Polytechnic. Out of which 432 (80.0%) questionnaires were responded. Out of 432 (80.00%) responded, 62.5% are male; 37.5% are female; 36.80% are belong to Engineering; 30.75% are from Arts & science; 20.60% are from Medical and 11.80% are from Polytechnic institutions. The collected data were analysed using SPSS package. The opinion of professionals were obtained on various digitisation trends and techniques such as digital storage, storage security, various formats, metadata, standards, servers, software etc. It is identified that their exist awareness on digitisation trends and techniques as well as inquisitiveness in continuous learning on the conceptual factors of digitisation.**

Keywords: **Digital Library, Digital Library Software, Formats, Metadata, Standards**

1. INTRODUCTION

The internet, web environment and associated sophisticated tools have given the library professionals a new dynamic role to play and serve the new information based society in better ways. The powerful features of web i.e., distributed, heterogeneous, collaborative, multimedia, multi-protocol, hypermedia-oriented architecture, WWW has revolutionised the way people access information, and has opened up new possibilities in areas of scientific information retrieval and dissemination such as digital libraries, virtual libraries.

Today's information professionals need to learn more about technology monopolies information retrieval systems and at the same time need to learn the conceptual theory, tools and techniques behind the traditional approaches in organising and processing information, much of which will be applicable in the storage and retrieval of electronic information in digital libraries (Chowdhury, 1999) [1].

Digital libraries are a set of electronic resources and associated technical capabilities for creating, searching, and using information. In this sense, they are an extension and enhancement of information storage and retrieval systems that manipulate digital data in any medium such as text, images, sounds; static or dynamic images and exist in distributed networks. The content of digital libraries includes data, metadata that describe representation, creator, owner, reproduction rights, and metadata that consist of links or relationships to other data or metadata, whether internal or external to the digital library. Thus a digital library, provides digital resources and services, various digital formats, are based on traditional library skills, enabling materials to evaluated, organised, stored, retrieved and used.

II. RELATED STUDIES

As delivery mechanisms improved and users became more comfortable with the technology, problems with the physical infrastructure no longer dominated assessment results Marchionini (2000) [2]. Stelmaszewska and Blandford (2002) have demonstrated the need for effective usability design in digital libraries for assisting the creation of information searching strategies [3].

Xie (2006) user based digital library evaluation criteria. These criteria were analyzed and classi?ed them in ?ve categories, via usability, collection quality, service quality, system performance eff ciency and users opinions [4].

Saracevic and Covi (2000) proposes four major aspects such as construct for evaluation, context of evaluation, criteria for evaluation and methodology of evaluation regards to digital library evaluation [5].

B. Prakash and D.B. Patil collected the data about the websites of all Central Universities of India. Out of 41 Central Universities of India, 40 universities have their websites [6]. Obiora Nwosu and Isaac Echezonam Anyira investigated the use of Google and Yahoo search engines in retrieving relevant information resources by Nigerian internet users [7]. S. Dhanavandan demonstrated and elaborated the digital libraries software and it types used in self- financing engineering

college (SFEC) libraries in Tamil Nadu [8]. C.S Chandra Mohan Kumar and J.Dominic examined the use of Information Communication Technology (ICT) in 32Engineering College Libraries in Coimbatore, Tamil Nadu by investigating the ICT infrastructure, current status of library automation, barriers to implementation of library automation and also librarians' attitudes towards the use of ICT and the availability of computers in libraries [9].

None of studies has evaluated the awareness on Digital Library trends and techniques by the LIS professionals. This study evaluates the awareness on Digital Library trends and techniques among LIS professionals.

III. OBJECTIVES

The major objectives of the study are;

a. To identify the list of factors those are essential for implementing and maintaining the digital library;

b. To identify the awareness of the professionals on digital library software and required hardware;

c. To identify the awareness of the professionals on digital storage and security issues on digital storage;

d. To identify the awareness on various digital library formats among the professionals;

e. To identify the awareness on various standards relevant to digital library among the LIS professionals.

IV. HYPOTHESES

The following hypotheses were formed based on the objectives.

1. The library professionals have a fair amount of knowledge on the concept of digitisation trends and techniques.

2. There is no significant difference on the levels of awareness on the conceptual knowledge on digitisation trends and techniques among the library professionals irrespective of Gender, designation and experience.

3. There exist a significant difference on the mode of learning on the conceptual factors were identical among the library professionals.

V. METHODOLOGY

The awareness on digital library trends and techniques among the LIS professionals has been identified through self appraisal method. The data were collected from the LIS professionals working in various higher educational institutions in and around Chennai using structured questionnaire. The LIS professionals 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 540 LIS professionals working in 348 higher educational institutions of different domains such as Engineering, Arts & science, Medical and Polytechnic situated in and around Chennai. Out of 432 (80.00%) responded, (62.5%) are male; (37.5%) are female; (36.80%) are belong to engineering; (30.75%) are from arts & science; (20.60%) are from medical and (11.80%) are from polytechnic.

VI. DATA ANALYSIS

The ten conceptual factors have been identified as essential for implementing and maintaining the digital library. These factors along with the description of each factor have been shown in Table I.

TABLE I FACTORS AND THEIR DESCRIPTIONS

S. No.	Factors	Description
1	Digital Storage	CD, DVD, Blue Ray disc etc
2	Digital Storage Security	DOI, digital signature, watermarking etc.
3	Graphic Formats	JPEG, GIF, TIFF, CGI etc.
4	Audio Formats	WAV, MIDI, AVI, MP3, MP4, MODS etc
5	Moving Image formats	Real video, quick time, Vivo active, AVI, MPEG, VRML etc.
6	Metadata	Dublin core, AGRIS etc.
7	Server Programs	SQL, MYSQL, TOMCAT, APACHE, ORACLE etc.
8	Digital Library Software	Greenstone, DSpace, Eprints, Fedora, Roads etc.
9	Metadata Standards	MARCXML, MODS, METS, MIX, PREMIS etc.
10	Digital Library Standards	TEXMD, ISO/DIS 25577, ISO 20775, ISO 639-2/RA, CQL etc

TABLE II DIGITISATION TRENDS AND TECHNIQUES

S.No	Description	NS	L	F	P	Mean	SD	Rank
1	Digital Storage	20 (4.6)	77 (17.8)	140 (32.4)	195 (45.1)	3.18	0.885	1
2	Digital Storage Security	25 (5.8)	139 (32.2)	145 (33.6)	123 (28.5)	2.84	0.903	4
3	Graphic Formats	39 (9.0)	58 (13.4)	241 (55.8)	94 (21.8)	2.90	0.839	2
4	Audio Formats	52 (12.0)	154 (35.6)	120 (27.8)	106 (24.5)	2.64	0.980	6
5	Moving Image formats	40 (9.3)	98 (22.7)	215 (49.8)	79 (18.3)	2.77	0.853	5
6	Metadata	161 (37.3)	212 (49.1)	56 (13.0)	3 (0.7)	1.77	0.691	10
7	Server Programs	144 (33.3)	99 (22.9)	113 (26.2)	76 (17.6)	2.28	1.105	9
8	Digital Library Soft wares	27 (6.3)	151 (35.0)	101 (23.4)	153 (35.4)	2.87	0.970	3
9	Metadata Standards	109 (25.2)	127 (29.4)	150 (34.7)	46 (10.6)	2.30	0.965	8
10	Digital Library Standards	63 (14.6)	175 (40.5)	133 (30.8)	61 (14.1)	2.44	0.907	7

The level of awareness on those ten factors were obtained from LIS professionals on four point scale such as 'No Skill', 'Learning', 'Familiar' and 'Proficient'. The same is shown in Table II. The mean and standard deviation were calculated based on opinions. The ranks were assigned based on the mean and standard deviation.

It can be seen from the table that the LIS professional are familiar and proficient in case, of digital storage; graphic formats and digital library software. Least awareness is seen in case of metadata and server programs.

No skill on digital library trends and techniques ranges from 4.6% to 37.3%. Similarly the professionals who are in learning stage ranges from 13.4% to 49.1%. It indicates that nearly 40% to 60% of the professionals may not be known the digitisation trends and techniques or in the leaning process. The standard deviation ranges between 0.691 to 1.105 and it seems there is not much deviation in the opinion among LIS professionals.

The analysis was further extended to gender. The mean, standard deviation and rank were shown in shown in Table III.

The level of awareness is high in case of digital storage irrespective of gender. The level of awareness is high in case of digital library software, digital storage security among male professionals. In case of female professionals awareness is high in graphic formats and digital library software. Least awareness is seen in case of metadata irrespective of gender among the professionals.

TABLE III DIGITISATION TRENDS AND TECHNIQUES VS GENDER

S.No.	Description	Male			Female		
		M	SD	R	M	SD	R
1	Digital Storage	3.21	0.872	1	3.12	0.906	1
2	Digital Storage Security	2.84	0.871	3	2.85	0.957	4
3	Graphic Formats	2.80	0.875	5	3.06	0.753	2
4	Audio Formats	2.62	0.958	6	2.67	1.019	6
5	Moving Image formats	2.81	0.840	4	2.69	0.872	5
6	Metadata	1.77	0.712	10	1.75	0.657	10
7	Server Programs	2.35	1.11	8	2.15	1.08	9
8	Digital Library Soft wares	2.88	0.956	2	2.87	0.995	3
9	Metadata Standards	2.28	0.969	9	2.34	0.960	8
10	Digital Library Standards	2.45	0.885	7	2.42	0.944	7

M – Mean; SD - Standard Deviation; R - Rank

TABLE IV DIGITISATION TRENDS AND TECHNIQUES VS DESIGNATION

S.No.	Description	Librarian			Asst. Librarian		
		M	SD	R	M	SD	R
1	Digital Storage	3.18	0.874	1	3.18	0.904	1
2	Digital Storage Security	2.88	0.893	2	2.81	0.920	4
3	Graphic Formats	2.88	0.878	3	2.94	0.782	2
4	Audio Formats	2.70	0.963	6	2.57	1.003	6
5	Moving Image formats	2.78	0.862	5	2.76	0.844	5
6	Metadata	1.76	0.682	10	1.79	0.708	10
7	Server Programs	2.32	1.072	8	2.22	1.154	9
8	Digital Library Soft wares	2.85	0.962	4	2.93	0.983	3
9	Metadata Standards	2.24	0.962	9	2.41	0.965	8
10	Digital Library Standards	2.42	0.898	7	2.47	0.921	7

M-Mean; SD- Standard Deviation; R- Rank

The analysis is further carried out and compared with the designation of the professionals and the same is shown in Table IV.

It is seen from the table that the level of awareness is high in case of digital storage irrespective of designation. In case of librarians the level of awareness is high in digital storage security, graphic formats and digital library software and the same is ranked as second, third and fourth respectively. In case of assistant librarians more awareness in seen in graphic formats, digital library software and digital storage security and the same is ranked as second, third and fourth respectively. Least awareness is witnessed in case of metadata, metadata standards and server programs irrespective of designation.

The analysis is further compared with the domain of the institutions where the professionals are working and the same is shown in Table V.

It is seen from the table that the level of awareness is high in case of digital storage irrespective of domain of the institution. In engineering domain the level of awareness is high in digital storage security, graphic formats, digital library software and the same is ranked as second, third and fourth respectively. In case of medical, digital library software, digital storage security, audio formats were given second, third and fourth rank respectively. In case of arts and sciences domain graphic formats and digital library software were given second and third rank respectively. Least awareness is witnessed in case of metadata in all the domains.

The analysis is further extended to experience of the professionals and the same is shown in Table VI.

TABLE V DIGITISATION TRENDS AND TECHNIQUES VS DOMAIN OF THE INSTITUION

S. No.	Description	Medical			Engineering			Arts & science			Polytechnic		
		M	SD	R	M	SD	R	M	SD	R	M	SD	R
1	Digital Storage	3.12	0.951	1	3.21	0.872	1	3.16	0.869	1	3.25	0.868	1
2	Digital Storage Security	2.85	0.886	3	2.87	0.894	3	2.86	0.894	4	2.73	1.002	5
3	Graphic Formats	2.74	0.924	6	2.91	0.870	2	3.00	0.696	2	2.92	0.913	3
4	Audio Formats	2.82	0.960	4	2.64	0.976	6	2.57	1.010	6	2.57	0.944	8
5	Moving Image formats	2.82	0.820	5	2.74	0.797	5	2.71	0.936	5	2.94	0.858	2
6	Metadata	1.71	0.694	10	1.81	0.773	10	1.80	0.612	10	1.69	0.616	10
7	Server Programs	2.25	1.058	9	2.33	1.133	8	2.11	1.056	9	2.63	1.166	6
8	Digital Library Software	2.88	0.987	2	2.82	0.971	4	2.95	0.940	3	2.88	1.032	4
9	Metadata Standards	2.34	1.076	7	2.28	0.929	9	2.29	0.942	8	2.39	0.961	9
10	Digital Library Standards	2.33	0.914	8	2.45	0.884	7	2.46	0.917	7	2.59	0.942	7

M – Mean; SD - Standard Deviation; R - Rank

TABLE VI DIGITISATION TRENDS AND TECHNIQUES VS EXPERIENCE

S.No.	Description	Below 5 Yrs			6 to 10 Yrs			11 to 5 Yrs			Below 5 Yrs		
		M	SD	R	M	SD	R	M	SD	R	M	SD	R
1	Digital Storage	3.18	0.810	1	3.26	0.878	1	3.10	0.976	1	3.17	0.810	1
2	Digital Storage Security	2.81	0.904	4	2.83	0.927	4	2.83	0.898	3	3.00	0.863	2
3	Graphic Formats	2.88	0.797	3	3.01	0.831	2	2.81	0.863	4	2.88	0.878	4
4	Audio Formats	2.70	1.032	5	2.61	0.942	6	2.62	0.975	6	2.73	1.012	6
5	Moving Image formats	2.67	0.841	6	2.85	0.842	3	2.75	0.856	5	2.81	0.908	5
6	Metadata	1.65	0.665	10	1.83	0.671	10	1.84	0.727	10	1.65	0.683	10
7	Server Programs	2.16	1.107	9	2.42	1.103	8	2.16	1.114	9	2.44	1.056	8
8	Digital Library Soft wares	2.99	0.919	2	2.80	1.009	5	2.87	0.996	2	2.88	0.900	3
9	Metadata Standards	2.28	0.980	8	2.35	0.951	9	2.36	1.010	8	2.12	0.855	9
10	Digital Library Standards	2.48	0.975	7	2.44	0.893	7	2.42	0.863	7	2.44	0.938	7

M – Mean; SD - Standard Deviation; R - Rank

The level of awareness is high in case of digital storage irrespective of the experience of the professionals. In case of professionals having below five years of experience awareness is high in digital library software, graphic formats and the same is given second and third rank respectively. In case of professionals having ten years experience awareness is seen in case of graphic and moving image formats and the same is ranked as second and third respectively. Awareness is seen in digital library software, digital storage and ranked as second and third in case of professionals having above ten years of experience. In case of professionals having above fifteen years of experience awareness is seen in digital storage security and digital library software and ranked second and third respectively. Least awareness is seen in case of metadata irrespective of the experience of the professionals.

The study is extended to identify the mode of learning of the conceptual factors by the professionals. The professionals were asked to mark their mode of learning in four point scales such as "self thought", "book", "library seminar", "formal course". The same is shown in Table VII.

TABLE VII DIGITISATION TRENDS AND TECHNIQUES

S.No	Description	ST	B	LS	FC
1	Digital Storage	174 (40.3)	133 (30.8)	86 (19.9)	39 (9.0)
2	Digital Storage Security	76 (17.6)	241 (55.8)	85 (19.7)	30 (6.9)
3	Graphic Formats	20 (4.6)	115 (26.6)	125 (28.9)	172 (39.8)
4	Audio Formats	111 (25.7)	152 (35.2)	169 (39.1)	0 (0.0)
5	Moving Image formats	63 (14.6)	161 (37.3)	99 (22.9)	109 (25.2)
6	Metadata	132 (30.6)	137 (31.7)	145 (33.6)	18 (4.2)
7	Server Programs	167 (38.7)	89 (20.6)	89 (20.6)	87 (20.1)
8	Digital Library Soft wares	81 (18.8)	210 (48.6)	123 (28.5)	18 (4.2)
9	Metadata Standards	0 (0.0)	138 (31.9)	226 (52.3)	68 (15.7)
10	Digital Library Standards	93 (21.5)	281 (65.0)	28 (6.5)	30 (6.9)

ST-Self Thought; B-Book; LS-Library Seminar; FC-Formal Course

It can be seen from the Table VI that in case of digital storage the mode of learning is through self thought. The knowledge on server programs and metadata were acquired through self-thought. In case of digital storage security the professionals acquire knowledge through books. The same is seen in case of digital library software and moving image formats. Library seminar seems to be the mode of learning in case of metadata standards. In case of graphic formats the most of the professionals acquire knowledge through formal course.

VII. FINDINGS

The following are the findings of the study:

1. Ten conceptual factors such as digital storage; digital storage security; graphic formats; audio formats; moving image formats; metadata; server programs; digital library softwares; metadata standards; digital library standards were identified for digitisation trends and techniques.

2. Nearly 40% to 60% of the professionals may not be knowing the digitisation trends and techniques or in the process of learning. Level of awareness among the professionals is high on digital storage techniques. It is followed by graphic formats and digital library software.

3. The order of high preference is digital storage; graphic formats; digital library softwares and digital storage security.

4. The least order of preference is metadata; server programs and metadata standards.

5. There is no significant deviation is noted among gender on various trends and techniques of digitisation. The level of awareness is high in case of digital storage irrespective of gender.

6. There exists deviation in the level of awareness in the case of digitisation trends and techniques among LIS professionals on various conceptual factors irrespective of gender, designation, domain of the institution and experience.

VIII. CONCLUSION

Digital libraries have become of increasing significance in recent years, developing in functionality and content; and becoming accessible to a wider community of users. User satisfaction with, and indeed acceptance of, digital library services has not, however, increased to the extend which might be hoped. It seems clear that this neglect of digital library services must be associated with users' expectations of them, presumably low because of their level of awareness.

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