Perception and Use of Semantic and Social features of Digital Libraries among Library and Information Professionals

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The case of Special Libraries and Information Centres of Delhi NCR

Purpose – The paper identifies awareness among library and Information professionals (LISPs) on Semantic and Social technologies in digital library in Special Library and Information Centers (SLICs) of Delhi NCR (National Capital Region), India, and examine whether the existing semantic web technologies are capable of addressing the problems and concerns of Digital Library Systems in tune with the needs of the intended users and/or beneficiaries.

Design/Methodology/Approach – As part of the survey of the special libraries in NCR of Delhi, the questionnaires and personal visit were made to 48 libraries (spread over 16 categories) to collect the primary data. The requisite data of 48 special libraries, were collected, collated and analyzed accordingly.

Findings - The study has made clear that library and information professionals of SLICs have a fair knowledge of semantic and social solutions for the digital libraries. There are a lot of semantic and social features available in the digital libraries and there is an urgent need to increase its familiarity and use among LISPs. The study also, revealed that a couple of impediments that prevents the effective use and implementations of semantic and social features of the digital library features of the semantic digital library.

Practical implications- The study hopefully has given to an understanding the semantic solutions for the digital libraries based on semantic web technologies and results of the study can be accepted as a pointer for further experiment and training to improve these features of DLs to a new height.

Originality/value - The present study looks at awareness of semantic and social solutions for the digital library in different large scientific and special libraries of repute in Delhi and NCR is a comprehensive study which provides a subject of paramount significance and interest not only to LIS professionals, but also to web-technocrats and digital librarians in particular.

Keywords – Semantic Web, Semantic Digital Library, Digital Library, Social Semantic Digital Library

Paper type - Case study

1 Introduction

Paradigm shift from traditional digital library to social semantic digital library opens innovative and fresh possibilities to define digital library landscape. Contemporary digital library is not merely considered as a digitized collection with information management tools rather than digital library creates an environment to bring together collections, services, and people in support of the full life cycle of creation, dissemination, use, and preservation of data, information, and knowledge (Kalinichenko, 2015). Applying the semantic web technologies to the digital library is directly related to resource discovery and navigation across heterogeneous resources. It enables digital libraries more interactive, relevant and social by facilitating "improved navigation and retrieval within heterogeneous document environments, user profiling, personalization and contextualization, improved user interfaces and human-computer interaction" (Macgregor, 2008).

Adopting semantic web technologies to the digital library domain opens a door to a new kind of digital libraries popularly known as 'Semantic Digital Library(SDL)'which integrates information based on different metadata e.g.: resources, user profiles, bookmarks, taxonomies, provides interoperability as well as delivering more robust, user friendly and adaptable search and browsing interfaces empowered by semantics(Kruk, 2010). Social Semantic Digital Library (SSDL) is basically an outcome of the synergy between digital libraries, the Semantic Web, and social networking with aim to improve, among other things, usability of information discovery. Social networks are explicit representations of the relationships between individuals and groups in a community and provide the backbone for SSDL (Pandey and Panda, 2014). Several of these social network based virtual communities have begun to publish members' public profile information, including social links, using the semantic web language resource description framework (RDF) (Tim et al.,2005). Such RDFs can be reused and deployed to SSDL for better visualization of friends and community profiles as well as sharing and creation of knowledge within user communities.

SSDL brings out several key features to the end users/readers that are not available to the traditional digital library where focus is on delivering content/information and not on knowledge sharing within a community of users (Baruzzo et al., 2009). SSDL make users/readers involved in the content annotation process and allow users/readers to share their knowledge within a community as well as provide better communication between users in and across communities. Social Semantic digital libraries follows the ideas of semantic web and extend the digital libraries by describing and exposing its resources in a machine 'understandable' way and enforce the transition from a static information to a dynamic (collaborative) knowledge space.

Semantic solutions for the digital libraries are a very wide area and it is not possible to study and analyse the awareness of all semantic solutions that support digital libraries among LISPs and users of the digital libraries. Therefore, the present study limits its scope to some of the most prominent solutions e.g. information integration based on different metadata (resources, user profile, bookmark and taxonomy etc.), interoperability of different systems, more robust, user friendly and adoptive search and browsing interface available, which is widely adopted by users community .The scope of the present work has been limited to the study of the attributes of special libraries and information centres of NCR of Delhi, India.

2. Research questions and methodology

A total of 144 questionnaires were distributed (16 categories x 3 libraries x 3 LISPs) among the LISPs community to collect the primary data for the investigation. This questionnaire was designed to measure awareness of the semantic and social futures in the digital library, divided broadly under six subsections as follows:

  i.   Basic and Background Information;
 ii.   Digital Library Activities;
iii.   Semantic Digital Library Activities;
 iv.   Awareness of Semantic and Social Features for Digital Library among LISPs;
  v.   Constraints and Impediments in Using Semantic Digital Library; and

vi.   Suggestions and Recommendations.

Out of the total questionnaires distributed, 85 questionnaires duly filled by LISPs were received (59.02%).Table 1 shows the configuration of the respondents Library and Information Professionals. The total number of LISPs responded from each of the 16 categories of special libraries and information centres are depicted below:

Table 1: Configuration of respondent Library and Information Professionals

Sl. No.	Types of Special Libraries	Responses		
		No. of Responses	% of Total Responses	Cumulative %
1.	Health	6	7.1	7.1
2.	NGOs	3	3.5	10.6
3.	Music &Culture	5	5.9	16.5
4.	Law	6	7.1	23.6
5.	Management	4	4.7	28.3
6.	Economics and Social Sciences	8	9.8	37.7
7.	Defence	5	5.9	43.6
8.	Corporate	5	5.9	49.5
9.	News Paper and Media	3	3.5	53.0
10.	International Organization	4	4.7	57.7
11.	Science and Technology	6	7.1	64.7
12.	Govt./Autonomous	5	5.1	71.8
13.	Agriculture	9	10.6	81.2
14.	Education	5	5.9	87.1
15.	Maps , Design and Archives	6	7.1	94.2
16.	Legislative	5	5.9	100.0
	Total	85	100	

Table 1 shows that, there is highest number of response received from the respondents who are working in the agricultural libraries(10.6%); followed by Economics and Social Science libraries(9.8%) compared to NGO and Newspaper and Media libraries with a response rate of 3.5% from LISPs of SLICs of Delhi NCR. Collected responses from LISPs of SLICs of Delhi NCR distributed among 16 categories were analysed using Statistical package SPSS resulting data and the bird eye view of demographic information of the research sample can be seen in Table 2.

Table 2. Descriptive information about LISPs

Category	Total Responses(TR)	Percentage
Gender Distribution of LISPs		
Male	56	65.9
Female	29	34.1
Total	***85***	***100***
Distribution of Respondents (LISPs) by designation		
Executive	17	20.0
Junior	24	28.2
Managerial	44	51.8
Total	***85***	***100.0***
Educational Background of LISPs		
Ph.D	10	11.8
M.Phil	3	3.5
Post Graduate	70	82.4
Undergraduate	2	2.4
Total	***85***	***100.0***

The gender-wise distribution of respondents selected for the study is given in the table 2, above clear shows that, out of total 85 responses, 56 are male (65.9%) and 29 are female (34.1%) who have responded with their field in questionnaire. It seems that male respondents are more pro-active and enthusiastic to provide information on the subject of investigation compared to their female counterparts.

In library environment, there are several tiers of library and information professionals. The tiers are like senior level management, middle level management and lower level management. For this study, we grouped all these categories of staff into three main classes such as Managerial Level, Executive and Junior Level respectively based on their nature of work and hierarchy within the organization. Accordingly, data were collected, through a structured questionnaire, from a total of 85 library professionals spread over 48 special libraries and information centres, out of which 44(51.8%) of them are in Managerial Level professionals, followed by 17(20%) are Executive Level professionals and the remaining 24(28.2%) are holding Junior level-professionals positions respectively. The elicited data shows that more

than half of the total respondents are holding managerial positions who are hopefully have better knowledge and skill on the semantic and social features of the DLs compared to the respondents holding junior positions.

The educational profile of the respondents shows that more than 97.6% of total respondents possess Post-Graduation and higher degrees (Pre-doctoral and doctoral) which is highly significant. The remaining 2.4% respondents are under graduate. As shown in the data depicted in table 2, 70(82.4%) of the LISPs are having post graduation degree; followed by 10(11.8%) have acquired PhD which is a quite positive sign as, such higher educational background would help the respondents to understand the semantic solutions in the Digital Libraries better.

3. Key Findings

Based upon the survey results and after a close analysis of the resultant data as well as perceptions and opinions of the users, the study arrived at the following key findings:

3. 1 Digital Libraries (DL's) Activities by LISPs

How bad or good a library is, can only be ascertained by its usage which the first-law of Library Science propounded by Dr. Ranganthan confirms. One of the key objectives of this table is to ascertain whether the respondents are using digital library? If so, what type of digital services they use and what type of collection of the digital libraries. The resultant responses are consolidated and placed in Table 3 below for necessary statistical analysis. Table 3, therefore, provides an overview of digital library usability by the LISPs.

Table no. 3: DL's Activities by LISPs

Sl. No.	Do you use Digital Library?			If, Yes		
1.	Type of Responses			Collection Type	Response	
					TR	% of TR
				Theses/Dissertations	16	20.0
2.	Yes	No. of TR*	80	Institute Publications/Articles	53	66.3
3.		In % of TR	94.1	Multimedia Lectures	23	28.8
4.	No	No. of TR*	5	E Books	24	3.0
5.		In % of TR	5.9	Others**	28	3.5

Notes: *: Total Responses; Others**: Projects reports (13) + Photographs (11) + Question paper (4)

Table 3 above makes clear that the whole spectrum of activities/collections and services are grouped under four classes. The elicited responses shows that, a majorities of LISPs (94.1%) use digital libraries in order to provide digital library services to the users in their organisations which is highly significant. However, the number of LISPs who are not using digital libraries are very less (5.9%).When this question was extended to the types of collection of the digital libraries used by LISPs, It is found that, majority of digital libraries used by LISPs contain Institute Publications/Articles (66.3%); followed by Multimedia Lectures (28.8%) respectively.

3.2 Familiarity with the Use of Semantic features of Digital Libraries by LISPs

The features of the digital libraries are determined on the basis of types of the software used. While in this part, LISPs had to respond the extent to which they are aware of the semantic features of digital library software, in the second part, respondents provided their responses the name and type of software used.

Table 4 indicate that, 75.3% of respondents LISPs are familiar with the use of semantic features of Digital Library Software, while the remaining 24.7% have never used semantic features in their digital library software. Further, on being interviewed, most of the respondents of these 24.7% said that, though they never have used semantic features in their digital library software but are aware about the concept of the same. This is may be due to their willingness to know the latest

technological advancement in the domain of digital libraries and semantic technologies.

Table no. 4. SDL's Activities by LISPs

Sl. No.	Familiarity with use of semantic features in Digital Library Software?			If, Yes		
	Type of Responses		TR	Software Used	Response	
					TR	% of TR
				Greenstone	16	25.0
1.	Yes	No. of TR*	64	Fedora	5	7.8
2.		In % of TR	75.3	Dspace	31	48.4
3.	No	No. of TR*	21	JeromeDL	1	1.6
		In % of TR	24.7	Eprints	6	10.0
				Others**	5	7.8

Notes: *: Total Responses; Others**: In-house developed (2) +Commercial (3)

The next question was the name and type of the software used for their digital libraries development. The resultant data have further indicated that there are five most popular software used to build digital libraries. As per the responses received, a majority (48.4%) of digital libraries used by LISPs have developed their digital libraries using DSpace Software (48.4%); followed by Greenstone (25%), and Eprints (10%) respectively. It is also makes clear that, most of the digital libraries are developed using open source software (92.8%) while only 7.8% of these are developed on other software/platforms which is highly significant.

3.3   Awareness of LISPs on Search (Technique) Features

Searching techniques significantly improve search results and information utilization. These techniques are integrated with many of digital libraries. As shown in the table 5, 52.9% professionals said that they prefer to use Boolean Techniques to search; followed by 52.9% prefer to use Truncation to search digital library resources. The questionnaire was designed in such a way that the respondents can select more than one option as are multiple search features were provided.

Table no. 5. Awareness of LISPs on Search (Technique) features of DLs

Sl. No.	Search Techniques	Responses				Total Responses	
		TR-YES	% of TR	TR-NO	% of TR	TR	%TR
1.	Proximity Searching	22	25.9	63	74.1	85	100
2.	Truncation	45	52.9	40	47.1	85	100
3.	Boolean	57	67.1	28	32.9	85	100
4.	Defined Dictionary	26	30.6	59	69.4	85	100
5.	Clustering	11	12.9	74	87.1	85	100
	Total	161		264			

Table 5, clearly shows that respondents are neither fully aware of digital library features nor they are using semantic features of digital library such as Defined Dictionary (30.6%), Clustering (12.9%) and Proximity Searching (25.9%) on regular basis. Features like, Proximity searching (25.9%) and clustering (12.9%) seems to have remained the least used features by the respondent. This could be attributed either to their ignorance about the utilitarian value of these features or they lack knowledge on technical-know-how of the use of these two features.

3.4   Awareness of LISPs on Browsing (Technique) Features

Browsing assists user to navigate among correlated searchable terms. As shown in table 6, 68.2% professionals said that they prefer to browse by Author/Title/Year; followed by 63.5 % browse alphabetically, and 67.1% prefer to browse digital library by subject respectively. The questionnaire was designed in such a way that the respondents can select more than one option as multiple browsing features were provided in the questionnaire, giving freed on to the respondents to opt one or more than option they feel alike.

Table no. 6. Awareness of LISPs on Browsing (Techniques) Features

Sl. No.	Browsing Techniques	Responses				Total Responses	
		TR-YES	% of TR	TR-NO	% of TR	TR	%TR
1.	By Author/Title/Year	58	68.2	27	31.8	85	100
2.	Alphabetically	54	63.5	31	36.5	85	100
3.	By Subject	57	67.1	28	32.9	85	100
4.	Customizable	13	15.3	72	84.7	85	100
5.	Browse with Exhibit	5	5.9	80	94.1	85	100
6.	Tag Filtering	9	10.6	76	89.4	85	100
7.	Taxonomy View	5	5.9	80	94.1	85	100
6.	Other	2	2.4	83	97.6	85	100
	Total	203			477		

Table 6, clearly shows that, the level of awareness of the respondents in regard to browsing techniques such as Customizable (15.3%), Browse with Exhibit (10.6%), Tag Filtering (5.9%) and Taxonomy View (2.4%) features in the digital libraries remained for from expectations. Out of the six categories of browsing techniques tested in questionnaire, the respondents are found to be well versed and comfort with three of the browsing techniques, namely by Author/Title/Year(68.2%), Alphabetically(63.5%), and by Subject(67.1%);while the remaining four(including 'other' category) received least attention pertaining to their use. This may be due to their ignorance about the use technique of these browsing features investigation can hopefully unfold.

3.5   Frequency of Use of Semantic Features by LISPs

Table 7 displays the frequency at which the LISPs use semantic features in the digital libraries. It can be noted from Table 7 that, the respondents use features like, 'Once in every day' in their Simple Search (41.2%), Advanced Search (24.7%), and Natural Language Search (28.2%) respectively; whereas, the frequency to use features such as Collaborative Browsing(4.7%), Semantic Tagging (3.5%) ,Bookmarking Resources (3.5%),Bookmark Sharing(3.5%),Blogging Resources(4.7%), Ranking Resources (3.5%), Bookmark Recommendation (1.2%), Resource Recommendation (1.2%), Taxonomy View (2.4%),Query Building Mechanism(1.2%) remained 'Once in every day' which is very less compared to the use of other semantic features.

Table No.7 Frequency of Use of Semantic Features

Sl. No.	Features	Never Use(0)		Once in a week(1)		Twice in a week(2)		Three times in a week(3)		Once in every day(4)	
		No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR
1.	Simple Search	5	5.9	19	22.4	12	14.1	14	16.5	35	41.2
2.	Advanced Search	2	2.4	21	24.7	17	20.0	24	28.2	21	24.7
3.	Natural Language Search	9	10.6	28	32.9	11	12.9	13	15.3	24	28.2
4.	Browsing	5	5.9	28	32.9	15	17.6	14	16.5	23	27.1
5.	Collaborative Browsing	61	71.8	16	18.8	1	1.2	3	3.5	4	4.7
6.	Semantic Tagging	53	62.4	22	25.9	5	5.9	2	2.4	3	3.5
7.	Bookmarking Resources	34	40.0	32	37.6	12	14.1	4	4.7	3	3.5
8.	Bookmark Sharing	55	64.7	16	18.8	8	9.4	3	3.5	3	3.5

9.	Blogging Resources	36	42.4	30	35.3	12	14.1	3	3.5	4	4.7
10.	Ranking Resources	61	71.8	14	16.5	6	7.1	1	1.2	3	3.5
11.	Bookmark Recommendation	63	74.1	15	17.6	4	4.7	2	2.4	1	1.2
12.	Resource Recommendation	60	70.6	17	20.0	4	4.7	3	3.5	1	1.2
13.	Taxonomy View	63	74.1	16	18.8	3	3.5	1	1.2	2	2.4
14.	Query Building Mechanism	69	81.2	8	9.4	4	4.7	3	3.5	1	1.2
	Total	576		282		114		90		128	

It is evident from the above Table 7 that, a large number of LISPs 'never use' semantic features such as Collaborative Browsing(71.8%),Semantic Tagging(62.4%) , Bookmarking Resources (40.0%) ,Bookmark Sharing(64.7%),Blogging Resources (42.4%) ,Ranking Resources(61.8%),Bookmark Recommendation (74.1%), Resource Recommendation (70.6%),Taxonomy View(74.1%), Query Building Mechanism (81.2%) which is more shocking.

3.6   Respondents' Level of Knowledge/Familiarity with Semantic Features

Table 8 shows the level of knowledge/familiarity with semantic features in the digital libraries by LISPs. Analysis of data shows that, 38(44.7%) LISPs put themselves under 'Novice' level for the features User Profiling; followed by 55.3% for Semantic Search, 50.6% for Semantic Browse, 52.9% for Recommendations, 50.6% for Taxonomy View, 55.3% for RDF Query Building and 48.2% for Tagging/bookmarking feature respectively rated as 'novice level' by respondents.

Table No.8 Level of Knowledge/Familiarity with Semantic Features

Sl. No.	Features	Novice		Intermediate		Advanced		Not-Aware	
		No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR
1.	User Profiling	38	44.7	14	16.5	9	10.6	24	28.2
2.	Semantic Search	47	55.3	9	10.6	5	5.9	24	28.2
3.	Semantic Browse	43	50.6	9	10.6	5	5.9	28	32.9
4.	Recommendations	45	52.9	7	8.2	4	4.7	29	34.1
5.	Taxonomy View	43	50.6	8	9.4	2	2.4	32	37.6
6.	RDF Query Building	47	55.3	4	4.7	2	2.4	32	37.6
7.	Tagging/bookmarking	41	48.2	13	15.3	2	2.4	29	34.1
	Total	304		64		29		198	

The resultant data as depicted in Table 8 confirmed that LISPs are very beginners in regards to their knowledge on semantic features, and nearly 35.0% LISPs are surprisingly not aware about semantic features in the digital libraries which needs serious introspection by the digital library authorities.

3.7 Expertise of features in Digital Library

Table 9 shows the level of expertise of the respondents (LISPs) on various semantic and social features in digital library. Results indicate that, respondents have a very good expertise in Bookmarking (50.6%) and RSS Feed (43.5%) features, while their level of expertise on features such as Semantic Tagging (44.7%) and Collaborative Browsing (36.5%) remained at a much lower level, hence not so encouraging.

Table 9 Expertise of following feature in Digital Library

Sl. No.	Features	Very Good		Good		Medium		Bad		Very Bad	
		No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR
1.	Customizable theme	25	29.4	22	25.9	10	11.8	0	0.0	28	32.9
2.	Interactive Features	27	31.8	23	27.1	11	12.9	2	2.4	22	25.9
3.	Customizable Contrast	31	36.5	21	24.7	18	21.2	8	9.4	7	8.2
4.	Visibility of list of friends	8	9.4	15	17.6	6	7.1	19	22.4	37	43.5
5.	Bookmarking	43	50.6	9	10.6	3	3.5	0	0.0	30	35.3
6.	RSS Feed	37	43.5	25	29.4	6	7.1	3	3.5	15	17.6
7.	Semantic Tagging	2	2.4	16	18.8	25	29.4	38	44.7	4	4.7
8.	Semantic Search	20	23.5	24	28.2	8	9.4	3	3.5	30	35.3
9.	Ranking and Tag Filtering	10	11.8	16	18.8	17	20.0	21	24.7	21	24.7
10.	Collaborative Browsing	1	1.2	5	5.9	46	54.1	31	36.5	2	2.4
11.	Rating Features	42	49.4	6	7.1	2	2.4	1	1.2	34	40.0
	Total	246		182		152		126		230	

It is also evident from the above Table 9 that, 43.5% of LISPs have very bad expertise in Visibility of list of friends features available in most of the modern days digital library software. This may be due to the fact that, the concept is very much new and recently came into existence in digital library domain.

3.8 Usefulness of Semantic Features

Table 10 makes a clear depiction of the responses of the LISPs on how useful are the semantic tools/features for the digital library. The result shows that, for the features like, Simple Search(72.9%), Advanced Search (63.5%) ,Semantic Search (69.4%), RSS feeds (45.9%) and Bookmarking (62.4%), professionals have given their opinion under 'very useful' category.

Table 10. Usefulness of Semantic Features

Sl. No.	Features	Very Useful		Useful		Not Useful		Don't Know	
		No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR
1.	Simple Search	62	72.9	20	23.5	1	1.2	2	2.4
2.	Advanced Search	54	63.5	28	32.9	1	1.2	2	2.4
3.	Semantic Search	59	69.4	18	21.2	1	1.2	7	8.2
4.	Semantic Browsing	29	34.1	24	28.2	1	1.2	31	36.5
5.	Recommendation	20	23.5	29	34.1	3	3.5	33	38.8
6.	RSS feeds	39	45.9	34	40.0	3	3.5	9	10.6
7.	Taxonomy View	21	24.7	29	34.1	1	1.2	34	40.0
8.	Semantic Tagging	19	22.4	36	42.4	2	2.4	28	32.9
9.	Bookmarking	53	62.4	19	22.4	1	1.2	12	14.1
10.	Tag Filtering	17	20.0	27	31.8	2	2.4	39	45.9
11.	RDF Query	12	14.1	18	21.2	2	2.4	53	62.4
	Total	385		282		18		250	

It is also evident from the above Table 10 that, 62.4 % professionals for RDF Query, 45.9% for Tag Filtering, 40% for Taxonomy View, 38.8% Recommendation and 36.5% for Semantic Browsing, however, expressed their ignorance about the utilitarian value of these features as they do not know that how useful are these features in the digital library for them. One can, therefore, safely infer from such balanced and mixed kit of responses that, the respondents seems to have acquired their expertise only on a set of specific features as they ask only in few select domain of the Digital Library. Hence, neither all the respondents are fully expertise nor completely unfamiliar with all the semantic features of DLs, may be their current job potions demands in specific feature of Digital Library domain.

3.9   Statement Judgments: Semantic Solutions for DL's

Table 11 shows the responses of professionals(LISPs) on how semantic solutions for the digital libraries is based on semantic web technologies integrated with social features that help library and information professionals. In formation elicited from the respondents under eight statements using five variables are consolidated and depicted in the following table for necessary statistical analysis and interpretation.

Table 11 Statement Judgments

Sl. No.	Statement	Strongly Agree		Agree		Disagree		Strongly Disagree		No Idea	
		No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR
1.	IVID[1]	49	57.6	34	40.0	1	1.2	0	0	1	1.2
2.	FIME[2]	51	60.0	31	36.5	0	0.0	0	0	3	3.5
3.	URMI[3]	38	44.7	27	31.8	2	2.4	0	0	18	21.2
4.	OCKS[4]	31	36.5	33	38.8	2	2.4	0	0	19	22.4
5.	PIOS[5]	20	23.5	33	38.8	0	0.0	0	0	32	37.6
6.	EPEC[6]	17	20.0	38	44.7	3	3.5	0	0	27	31.8
7.	DRUF[7]	31	36.5	42	49.4	1	1.2	0	0	11	12.9
8.	KOSS[8]	36	42.4	34	40.0	0	0.0	0	0	15	17.6
	Total	273		272		9		0		126	

Notes: **1.** Improve visibility and information discovery ; **2.** Enable users to find information more easily; **3.** Enable users to retain more information; **4.** Offers collaborative knowledge sharing; 5**.** Provide interoperability with other system; **6.** Enhance peer communication; **7.** Deliver more robust, user friendly and adaptable search and browsing; **8.** Integrate knowledge organization system, semantic web and social networking technologies.

Table 11 clearly reveals that, there is an inclination of the library and information professionals towards semantic solutions for the digital library. It is quite evident that, around 57.6 % respondents "strongly agree" and 40.0% only "agree" with the statement that semantic solutions for the digital library can improve visibility and information discovery; followed by 60.0 % "strongly agree" and 35.5% only "agree" with semantic solutions for the digital library enable users to find information more easily. It is quite surprising to note that, 37.6 % LISPs have 'no idea' that semantic solutions for the digital library can enhance peer communication; followed by 31.8% has no idea that semantic solutions can deliver more robust, user-friendly and adaptable search and browsing; although they have been using semantic features in the digital libraries quite for some time.

3.10 Opinion towards Semantic Solutions for the Digital Libraries

Table 12 depicts the perception of LISPs about the advantages of semantic and social solutions for digital libraries. The resultant data confirmed that, 57.6% of the total LIS Professionals surveyed feel that, semantic and social solutions for the digital library offers new way to information access and discovery; followed by 55.3 % opined that it facilitates more interaction through user profiling, rating, tagging and recommendation features; 43.5% feel that it helps in building collaborative knowledge through social tools; 35.3% feel that the use of semantic solutions Improves the precision and provides better visualization of information, whereas only 30.6% LISPs opined that semantic and social solutions may increase users satisfaction in getting his/her desired resource in time. The foregoing perceptions of the respondents seem to be healthy sign for the future DLs, though their percentage is not so encouraging.

Table 12: Opinion of LISPs towards Semantic Solutions for the Digital Libraries

Sl. No.	Opinion Statement(s)	Responses	
		No. of TR	% of TR
1.	ONWIAD[1]	49	57.6
2.	IMPR[2]	30	35.3
3.	HBCKST [3]	37	43.5
4.	FITURTR[4]	47	55.3
5.	PBVOI[5]	30	35.3
6.	USMIDR[6]	26	30.6

Notes: **1.** Offers new way to information access and discovery; **2.** Improves the precision; **3.** Helps in building collaborative knowledge through social tools; **4.** Facilitates more interaction through user profiling, rating, tagging and recommendation features; **5.** Provides better visualization of information; **6.** Users satisfaction may increase in getting his/her desire resource.

3.11 Constraints in Using Semantic Digital Library

There are several of barriers which might hinders the use of semantic digital library in special library and information centers(SLICs). LISPs may be interested to understand or implement semantic digital library concepts but may be due to six

reasons or barriers as depicted in the table 13, the respondents are discoraged or implimenting same in a slower pace. These problems could be administrative within the organisation, due to insufficient infrastructure and skilled manpower, etc.The opinion of the respondents on thease possible constrains are elicited under five variables.

Table No.13: Constraints

Sl. No.	Features	Not Responsible(0)		Less Responsible(1)		Least Responsible (2)		More Responsible(3)		Most Responsible(4)	
		No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR	No. of TR	% of TR
1.	Lack of Technical Support	2	2.4	11	12.9	16	18.8	37	43.5	19	22.4
2.	None Familiarity with semantic features	2	2.4	17	20.0	28	32.9	17	20.0	21	24.7
3.	Lack of Infrastructure	4	4.7	19	22.4	22	25.9	24	28.2	16	18.8
4.	Lack of skilled manpower	4	4.7	29	34.1	11	12.9	20	23.5	21	24.7
5.	User ignorance	7	8.2	18	21.2	27	31.8	17	20.0	16	18.8
6.	Lack of management support	9	10.6	12	14.1	16	18.8	28	32.9	20	23.5
	Total	28		106		120		143		113	

As per the depicted data, 43.5 % respondents consider 'Lack of Technical Support' as the key impediment in implimenting semantic digital library; follwed by 32.9% respondents consider lack of effective management support in its implementation; whereas 28.2% were of the opinion that 'Lack of Infrastructure' and 'lack of skilled manpower' are the most important barriers for implementation of the same.

3.12   Opinion Statement to Increase Usage to Semantic Digital Library

Table 14 indicates the suggestions and recommendations elicited from the respondents working in different SLICs. A close scrutiny of the suggestions received indicated that, 56.5% LISPs feel expansion of current infrastructure (latest Computers, software for DL) can increase the familiarities of semantic solutions for their digital libraries; followed by 40% consider Marketing/Promotion; 77.6% Tutorials/Demonstrations/Trainings are the priorities on the use of Semantic Digital Library. Similarly, 38.8 % of the respondents suggest class activities with the use of

semantic tools and 41.2% recommended the conduct of Seminars/Workshops would help to increase the usage to digital libraries. Even though, the foregoing suggestions are varied and diverse in nature, the same cannot be ignored as these suggestions are presumably the outcomes of respondents minute experience and observations over considerable period of time. The management of DLs, therefore, need to introspect these suggestions and explore their possible implementations.

Table no. 14: Opinion Statement to Increase Usage to Semantic Digital Library

Sl. No.	Opinion Statement	Responses	
		No. of TR	% of TR
1.	ECI [1]	48	56.5
2.	MAP[2]	34	40.0
3.	TDT[3]	66	77.6
4.	CAS[4]	33	38.8
5.	SEW[5]	35	41.2

Notes: **1.** Expansion of current infrastructure (latest Computers, software for DL); **2.** Marketing/Promotion; **3.** Tutorials/Demonstrations/Trainings on the use of SemDL; **4.** Class activities with the use of Semantic tools; **5.** Seminars/Workshops

It is marked from the above table 14 that, Tutorials/Demonstrations/Trainings on the use of Semantic Digital Library (77.6%) can be more to increase the usage effective suggested by LISPs in order to increase the use and familiarities of semantic solutions for the digital library concern.

3.13 Opinion Statement to Continue/Change the Existing Digital Library Software

No system or service is perpetual. It is dynamic and subject to change so, also software which is not an exception to this change. The more revision it goes, the more effective and customized service it provides. One of the key objectives of this table is to study perceptions of the LISPs as to whether they wish to consider the continuity of the existing Digital Library Software or they seek a change. The elicited responses are depicted in Table 15.The resultant data unveils the fact that, 76.47 % professionals are in favour of a change of the existing digital library software which is

highly significant. Only 23.47% respondents said that they do not want to change the same and continue to use existing digital library software.

Table no. 15: Statement to Continue/Change to Existing Digital Library Software

Sl. No		No. of TR	% of TR
1	No	20	23.47
2	Yes	65	76.47
	Total	85	100.0

When the investigator wanted to ascertain the reasons for the change of existing digital library software, the respondents furnished different reasons, which though are diverse and varied, but some of these seem to be quite logical and realistic hence, cannot be ignored. Some of the reasons specified by the respondents are reproduced below to sense the gravity of their feelings:

☞ *"As I have given my views regarding change of existing software, it is this because it doesn't provide that much precision of information which is required. Also if we have software other than we are using, we became aware of such semantic tools, and we know how to use and handle them. As we are in service so we don't have enough time to go and visit such type of libraries, that's why we have very nominal information regarding such libraries. As we all know only concept is not enough and that much informative and understandable as compared to when we experience it personally. It is only possible when our organization use such software."*

☞ *"We are not getting the real benefit of a digital library. The existing system is not very much compatible with current information retrieval methodology. There is no any facility of ranking document, assign relevancy, truncation and proximity searching etc. So for any user it is difficult to retrieve any information different keywords or keyword with spelling error"*

☞ *"Presently using Boolean search, Field specific search, Date range search and keyword search. The Semantic search will bring new revolution in searching methodology and enhance user satisfaction"*

☞ *"Today users are more convenient in web 2.0 based applications where semantic web ontology fulfill all specifications and requirements. I hope it will boom in the digital environment"*

It is found that most of the statements in favor of change of the existing digital library software are based upon the issues aimed at providing much precision information; getting information in least possible time; making the digital library system and retrieval methodologies more compatible; facilitating of ranking documents; assigning relevancy, permitting truncation and proximity searching; improving searching methodology and enhancing user satisfaction; resorting to web 2.0 applications, and resorting to collaborative and interactive model to ensure under-empowerment are few worthy mentions.

4 Conclusion

The study has made clear that library and information professionals of the special libraries and information centres have a fair knowledge of semantic and social solutions for the digital libraries. The resultant data further pointed out that, professionals in different organisation are quite aware and started using semantic and social features in the digital library, even through their in-house developed digital libraries or subscriptions/free digital libraries are available on World Wide Web. There are a lot of semantic and social features available in the digital libraries and there is an urgent need to increase its familiarity and use among library and Information professionals and users of the SLICs. The study also, revealed that a couple of impediments that prevents the effective use and implementations of semantic and social features of the digital library features of the semantic digital library.

Thus, the above opinions of the respondents can be accepted as a pointer that the existing digital libraries as well as knowledge of LIS professionals on semantic and social features of DLs are still in an embryonic state and, therefore, requires further experiment and training to improve these features of DLs to a new height.

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