Original Article

Effective use of ICTs and Digital Library Initiatives in Research Institutes and R & D Organizations in Karnataka : A Study

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Abstract

Digital library initiatives are vertebral column for development of digital libraries in the professional world and Information Communication Technology (ICT) become inevitable in the present information explosion. The heavy usage of digital and electronic resources has increased expectations of library profession so to meet the needs and expectations of the user's one stop solution is adopt modern ICT facilities. The present study focuses on LIS professional's background, research institutional R & Organizations library information, ICT facilities, LIS services offered, digital library initiatives, professional expertise in research institutions and R & D organizations in Karnataka.

Keywords: Information Communication Technology (ICT); Digital Library Initiatives; Research Institute; R & D Organization.

Introduction

Digital library Initiatives and Digital Libraries are made information access very easy due technological advancement particularly in Information Communication Technology (ICT) has converted globe in to modern informative globe, information available anywhere in the world can be accessed through the present digital libraries. Present libraries are adopting new technologies to fulfill the needs and requirements of the users than before.

Research institutes and research organizations libraries are providing innovative services to their user community; still the advancement of technology has made professionals to bite nails in some issues. The present situation demands professional expertise, technical expertise, ICT infrastructure requirement and proper electronic and digital resources for developing good user oriented library and information resource centers. With this in background the authors conducted a study analyze the ICT facilities, digital library initiatives, LIS services offered by the Research Institute and Research & Development (R & D) Organizations libraries in Karnataka.

Objectives of the Study

1. To know background of LIS professionals wor king in Research Institutes and R & D organizations in Karnataka State.

2. To study the R & D organizations and institutio nal information as well as Library and Information Centers

3. To assess the availability of electronic resources under the study institutions and organizations.

4. To analyze the Library and Information Services provided by the research institutions and R & D organizations in Karnataka State

5. To understand the ICT based services provided by the institutions and organizations under the study.

6. To examine the professional expertise in handling modern technologies such as ILMS, Digital Library and IR software etc.,

7. To know the state of the art of information communication technology (ICT) facilities in research institutes and Research organizations in Karnataka

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8. To know the digital library initiatives in research institutions and R & D organizations in the State of Karnataka.

9. To suggest the networking of research institutes and R & D organizations for better resource sharing between and among the library and information centers.

Methodology of the study

A well structured questionnaire was designed keeping in view of the objectives of the study. The questions were simple consisting of both open and closed ended questions. The structured questionnaire was distributed to librarians/information scientists, for this purpose the principal researcher has visited personally all the forty libraries information centers in different part sof Karnataka. The response was positive and the professionals working in these organizations encourage the researchers to complete the task in time. After obtained the completed the questions were tabulated using MS excel and the same were analyzed.

Analysis of the Data

4.1. Background information about Librarians/ Information Scientists

It can be observed from the table 1 that 22 (55.00%) of the respondents are male Librarians or i/c scientists and rest of them i.e.,18 (45.00%) of them are female librarians were working in different research institutes and R & D organizations of Karnataka. The maximum number of respondents are 41-50 years of age group and 23 (57.50%), of them are have prescribed educational qualification. The above average 35 (87.50%) respondents are less than 15 years of experience i.e., 21(52.50%). It was interesting to note that majority 38 (95.00%) of the respondents were enrolled as a member in various professional discussion to forms. On the other hand only 16 librarians and or information scientists are taken membership various professional association such as ILA, IASLIC, SLA etc.,

Sl. No.	Personal Information	Groups	Respondents	%	Cum. %
1.	Sex	Male	22	55.00	55.00
		Female	18	45.00	100.00
2.	Age	31-40	3	7.50	7.50
		41-50	23	57.50	65.00
		50+	14	35.00	100.00
3.	Designation	Librarian	24	60.00	60.00
		Asst. Librarian	2	5.00	65.00
		In-Charge	14	35.00	100.00
4.	Educational Qualification	Prescribed	35	87.50	87.50
		Over Prescribed	5	12.50	100.00
5.	Experience	Less (<15 years)	21	52.50	52.50
		More (>15 years)	19	47.50	100.00
6.	Member of Forum	Yes	38	95.00	95.00
		No	2	5.00	100.00
7.	Membership in Library Association	Yes	16	40.00	40.00
		No	24	60.00	100.00

Table 1: Background information about Librarains

4.2. Institutional and Background Library and Information Center

The State of Karnataka is the hub of Information Technology and research institutes and R & D organizations covering different research field. From the table 2, it was observed there are 31 (77.50%) research institutes and 9 (22.50%) R & D organizations are conducting research different areas.

These institutes and organizations are have large of research scholars i.e., 9403(79.80%) followed by administrators and scientists. The majority 23 (57.5%) of the library and information centers are following open access system followed by mixed access 17 (42.50%) i.e., both open access as well closed access to reading and research materials. Almost all the libraries are non air conditioned i.e., 39(97.50%) but

Table 2: Institutional and Background Library and Information Center

Sl. No.	Institutional Information	Groups	Respondents	%	Cum. %
1.	Organization Type	Research Institute	31	77.50	77.50
		R & D Organizations	9	22.50	100.00
2.	Library users	Scientists	223	1.90	1.90
		Administrators	2158	18.30	20.20
		Research Students	9403	79.80	100.00
3.	Library Access type	Open Access	23	57.50	57.50
		Closed Access	-	-	57.50
		Mixed	17	42.50	100.00
4.	Air conditioned	No	39	97.50	97.50
		Yes	1	2.50	100.00
5.	Security and Disaster Management measures taken	Yes	39	97.50	97.50
		No	-	-	-
		Planned	1	2.50	100.00
6.	Library housed in	Separate building	21	52.50	52.50
		Part of Main Organization building	19	47.50	100.00
7	Source of Finance	State Government.	6	15.00	15.00
		Central Government	32	80.00	95.00
		Consultancy and Project	2	5.00	100.00

adopted good security and disaster management system. Above average libraries are functioning in a separate library buildings i.e., 21(52.50) and majority 32(80%) of the libraries are funded by the central government and only 6(15.00%) libraries funded by state government.

4.3. Library and Information Services offered by the Library

Research libraries and information centres are service oriented center to support to parent organization and institutions, whose primary goal is to identify, collect, organize, sotre and provide access to information through variety of library and information services. Since from early days research libraries are offering variety of library and information services depending on the scientists needs and also based on resources and facilities available in libraries and information centers now they have expanded their range of services with the emergence of electronic and digital scholarly resources with blending of ICT. The table 4 presents the various library and information services incuding electronic services provided by the research institutes and R & D organisations in Karnataka State. It is quite obvious that all most all the libraries 40(100%) are providing circualtion, interlibrary loan and photocopying services to their scientific community. 36(90.00%) libarries are providing telephone, fax facility, typing, scanning and printing services. 31(77.50%) and 28(70.00%) of libraries are providing newspaper clipping service and display of new arriavles of documents. 16(40.00%) libraries are offering audio visual presentation shows, only 5(12.50%) of libraries conducting user education.

Electronic information services have became the vital part of research and scientific life in the 21st century. It has rapidly changed the way of seeking and disseminating information particularly in research and development organisation. All the research and R & D libraries (40) under the study are providing Current Awareness (CAS) and Reference services. These services are necessary for the scientific community to update current development in their respective field, subsequently 33(82.50%) libraries are providing SDI and referral services. 31(77.50%) and 25(62.50%) libraries are offering bibliographical service and indexing and abstracting service respectively. Only 8(20.00%) libraries are supplying documents through document delivery service(DDS). Though the article alert service, information literacy progammes and literature search services are most essential services for the scientific community but only few research libraries are offering these services. On the other hand the research and R & D libraries are adopted extensively information and communication technology to provide electronic and online services. It was observed from the table all the libraries are computerized and providing OPAC and WebOPAC access facility to search and retrieve the documents available in the library followed by online access to database i.e., 35(87.50%) and E-current

Table 3: Library Services provided by the respondents

Sl. No.	Library & Information Services	Yes No.	Yes %	No No.	No %
1.	Circulation Service	40	100.0	-	-
2.	ILL Service	40	100.00	-	-
3.	Newspaper Clipping Service	28	70.00	12	30.00
4.	User Education	5	12.50	35	87.50
5.	Display of New Arrivals	31	77.50	9	22.50
6.	Typing, scanning and printing Service	36	90.00	4	10.00
7.	Digital photography and photo editing	3	7.50	37	92.50
8.	Photocopying service	40	100	--	--
9.	Telephone/Fax Service	36	90.00	4	10.00
10.	Audio Visuals Presentation Shows	16	40.00	24	60.00
Information Services					
11	Current Awareness Service (CAS)	40	100	---	---
12	SDI Service	33	82.50	7	17.50
13	Reference Service	40	100	---	---
14	Referral Services	33	82.50	5	17.50
15	Bibliographical Service	31	77.50	9	22.5
16	Indexing and Abstracting Services	25	62.50	15	37.50
17	Article Alert Service/Content Page of Journal	6	15.00	34	85.00
18	Document Delivery Service (DDS)	8	20.00	32	80.00
19	Information Literacy Programme	3	7.50	37	92.50
20	Literature Search Service	2	5.00	38	95.00
Electronic Information Services					
21	E-current Awareness Services (E-CAS)	32	80.00	8	20.00
22	E-Document delivery Service (E-DDI)	6	15.00	34	85.00
23	Online Access to databases	35	87.50	5	12.50
24	E-Bibliographic Service	26	65.00	14	35.00
25	OPAC, Web OPAC	40	----	--	---
26	CD-ROM Search Service	24	60.00	16	40.00
27	Digital/Virtual Reference Service	4	10.00	36	90.00
28	Ask Librarian/Online Chat	18	45.00	22	55.00
29	Bulletin Board Service	1	2.50	39	97.50

awareness service 32(80.00%). 26(65.00%) and 24 (60%) libraries providing E-bibliography service CD-ROM search facility. It is interesting to note that 18(45%) libraries are offering ask librarian and chat services to scientific community.

4.4. Professional expertise among the Librarians/ information scientists

With the technological advancements and emerging innovative technology the LIS professionals need to have through knowledge in the technological development and its positive application to library housekeeping operation and providing effective library and information services to user's community.

In the context the researcher want to know the level of professional expertise in handling of computer, competency in trouble shooting, ILMS, OPAC, Library web portal management, various internet tools and search techniques, building and management of digital library and Institutional repository. It was good to know that all most all the librarians and information scientists expressed that they have sufficient knowledge on the above attributes.

4.5. Availability of Infrastructure facilities in libraries

The ICT infrastructure such as computers, communication and network accessories, graphical

Table 4: Professional Staff Expertise among the Respondents

Sl. No.	Professional Staff Expertise	Yes		No	
		No.	%	No.	%
1.	Computer Expertise (Hardware & Software)	38	95.00	2	5.00
2.	Competency and Trouble Shooting	38	95.00	2	5.00
3.	Integrated Library Management System (ILMS)	40	100.00	-	-
4.	OPAC/Web OPAC	40	100.00	-	-
5.	Web Portal	40	100.00	-	-
6.	Internet Tools and Techniques	40	100.00	-	-
7.	Digital Library	40	100.00	-	-
8.	Institutional Repository	40	100.00	-	-

reproduction systems, printers and other technologies including the UPS facilities are the essential requirements to provide easy, fast and wider access to information resources and services. Since early days the library and information centres are adopting the contemporary technologies both for library housekeeping operations and also to provide networked information access and retrieval facilities for the users. Hence, researcher made an attempt to investigate the existence of ICT infrastructure

Table 5: Availability of Infrastructure facilities

Sl. No.	Equipments	Available		Not Available		Total in Nos.
1.	Computers	40	100.0	-	-	343
2.	Servers	40	100.0	-	-	50
3.	Mirror Server	15	37.50	25	62.50	15
4.	CD. Net Server	12	30.00	28	70.00	12
5.	CD ROM Tower	31	77.50	9	22.50	42
6.	CD DVD Writer	40	100	--	---	48
7.	LCD Projector	10	25.00	30	75.00	10
8.	Television	2	5.00	38	95.00	3
9.	VCR	1	2.50	39	97.50	1
10.	Clients Computer Workstations	25	62.50	15	37.50	72
11.	Type of Campus Network	14	35.00	26	65.00	14
12.	Blue Ray Disc	40	100.0	0	0.00	0
13.	Scanners	40	100	--	--	63
14.	Barcode Scanner and Reader	29	72.50	11	27.50	33
15.	Barcode Printer	29	72.50	11	27.50	30
16.	Dot Matrix Printer	14	35.00	26	65.00	16
17.	Ink Jet Printer	17	42.50	23	57.50	19
18.	Laser Printer	40	100.0			68
19.	Back up Device	40	---	--	--	38
20.	UPS	40	---	--	2.50	40
21.	Generator	3	7.50	37	92.50	3
22.	Web/Digital Camera	2	5.0	38	95.00	2
23.	Campus Network	1	2.50	39	97.50	1
	Total					**923**

facilities in research institutes and R & D organisations in Karnataka. It is observed from the table that all the 40 libraries with 100% coverage have requisitely good ICT infrastructure facilities in terms of Computers, Servers, Blue Ray Disc, Scanners, Laser printers, backup devices and UPS handling library activities and functions. Some libraries are having barcode printer and scanner i.e., 29(72.50%), client computer work stations 25(62.50%), and mirror servers 15(37.50%) in their libraries. Only few libraries are having LCD projectors i.e., 10(25.00%), Generator

i.e., 3(7.50%) etc., It is now found in most of Library and information centres these above are some of the common and essential ICT infrastructure facilities provided for the use of the information resources and services.

4.6. Digital Library Initiatives

Out of 32 research institutes 11 of them are set up the digital library store, organize, disseminate and preserve the digital resources. On the other hand out 9 R & D organizations 6 of them are developed the digital library.

Sl. No.	Digital Library Initiatives	Yes		No	
		No.	%	No.	%
1.	Research Institutes	11	27.50	29	72.50
2.	Research & Development Organizations	6	15.00	34	85.00

Table 6: Digital Library Initiatives in research institutes and R & D organization

Major Findings of the study

➢ Majority of the 22 (55.00%) of the respondents are male Librarians or i/c scientists and rest of them i.e.,18 (45.00%) of them are female librarians were working in different research institutes and R & D organizations of Karnataka.

➢ It was interesting to note that majority 38 (95.00%) of the respondents were enrolled as a member in various professional discussion to forms. On the other hand only 16 librarians and or information scientists are taken membership various professional association.

➢ There are 31 (77.50%) research institutes and 9 (22.50%) R & D organizations are conducting research different field.

➢ Majority 23 (57.5%) of the library and information centers are following open access system followed by mixed access 17 (42.50%) i.e., both open access as well closed access to reading and research materials.

➢ Above average libraries are functioning in a separate library buildings i.e., 21(52.50) and majority 32(80%) of the libraries are funded by the central government and only 6(15.00%) libraries funded by state government.

➢ It is quite obvious that all most all the libraries 40(100%) are providing circualtion, interlibrary loan and photocopying services to their scientific community. 36(90.00%) libarries are providing telephone, fax facility, typing, scanning and printing services. 31(77.50%) and 28(70.00%) of

libraries are providing newspaper clipping service and display of new arriavles of documents.

➢ It was observed from the study all the libraries are computerized and providing OPAC and WebOPAC access facility to search and retrieve the documents available in the library followed by online access to database i.e., 35(87.50%) and E-current awareness service 32(80.00%).

➢ It was good to know that all most all the librarians and information scientists working in research institutes and R & D organizations in Karnataka expressed that they have sufficient professional knowledge to held ILMS, digital library and IR.

➢ All the libraries are having sufficient computers, servers, Blue Ray Disc, scanners, laser printers, backup devices and UPS handling library activities and functions.

➢ It was found that the most of research Institutes and R& D organization libraries are having good infrastructure and ICT facilities.

➢ Almost all the research libraries are having good collection of print and non print collection including E-database & E-journals and they are providing quite good number of services to their users.

➢ Out of 32 research institutes 11 of them are set up the digital library store, organize, disseminate and preserve the digital resources. On the other hand out 9 R & D organizations 6 of them are developed the digital library.

Suggestions

❖ Nearly half the research institute and R & D Libraries in Karnataka is head i/c of the Library and Information centers. It is recommended from the study the concerned competent authorities need appoint professionally qualified Librarian or Information Scientist to management and provide better library and information services to scientific community.

❖ The LIS professionals working in the research institutes and R & D organizations are not taken any membership from the professionals association. Therefore strongly suggest from the study, the LIS professional working in these institute should take membership both National and International association to uphold the professional values and image.

❖ Nearly half of the research libraries are function ing in part of main building of the research institute. It suggest that the concerned authorities and both central and state government need to provide financial assistant to construction of new independent library building for better functioning and to provide innovative library and information services.

❖ The professionals working in research institute and R & D organizations under study are having good expertise in handling modern technological tools, techniques and strategies blending with availability of all state of the art technologies it need be collaborated scholarly and intellectual work for over success of library and information centers.

❖ Further the networking of all the libraries in In dia in general and Karnataka in particular to facilitate greater resource sharing between and among the research institutions and R & D organization it minimize the cost of resources and maximize user satisfaction.

❖ Though the ICTs are widely available with professional expertise, only few libraries are initiated the digital library and Institutional repositories. It strong suggests from the study that all the research libraries and R & D organizations need develop digital library IR for scholarly digital resources and services.

Conclusion

The technological emerging trends and growing convergence in digital technology, networking, processing and storage technologies, and computer networks has provided a means whereby information can be stored, retrieved, disseminated and duplicated in a fast and efficient manner and can be accessible anywhere, anytime and also in a desired mode or format. This implies that digital library technologies are by now well established and understood throughout where information is a key input in the organization development and provide a competitive advantage over others. The Research and Development (R & D) organizations and higher educational institutions are the potential users of the most information resources, either in the form of 'born-digital' materials or the archival digital resources. The universities and more so the R & D Organization Library and Information Centers in particular, have been on the dynamic path of development of the so-called 'digital collection or digital libraries'. It is stated by Dillion (1999) that most current libraries based on a working model conceptualized in the 19th century are simply not structured to handle the current volume of books, journals, multimedia and other electronic resources.

References

1. Arms W. Digital libraries. Cambridge, MA: MIT Press, 2000, p2.

2. Dillon D. Making the wild wind invisible: Information technology in a brave new world. S.H Lee (Ed.), Collection development in a digital environment. The Haworth Press, New York, 1999.Jeevan V.K.J. Digital library development: Identifying sources of content for developing countries with special reference to India. *The International Information & Library Review*, Elsevier publication, 2004, 36, 185–197.

3.   Fox E.A. NDLTD: Networked digital library of theses and dissertations. 1997.   http://www.ndltd.org Retrieved on 20th December, 2014.

4. Choudhary, Pravin Kumar. *Et all,* Challenges for LIS professionals in the digital era. Library and information networking. Papers of the National convention on library and information networking (NACLIN), Cochin (India), October 21-24, 2002. Ed. By H.K.Kaul and M.D.Baby. New Delhi: DELNET, 2002, pp254-267.

5. Suleman Hussein, and Edward A Fox. A framework for building open digital libraries, *D-Lib Magazine*, 2001, 7(12). http://www.dlib.org/dlib/december01/suleman/12suleman.html. Retrieved on 24th December 2014.