

Measurement and Evaluation of Library Resources and Services in ICT Environment: A Survey of Selected Colleges

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Abstract

This paper presents an overview of the library information resources and services provided by the engineering and technology institute libraries of University of Delhi and GGSIP University, Delhi. Evaluate the collection of print and digital resources and reflects the views of library professionals in respect to their usage. Further, the paper highlights and analysed the user's satisfaction rate of manual and ICT based services. It also discussed the general benefits of ICT comparing with manually operated activities of library.

Keywords: *Library Resources & Services, Library Automation, User assessment and satisfaction*

1. INTRODUCTION

The ultimate objective of a library is to extend the quality service to its clientele. It is necessary to develop the quality information resources and compatible IT infrastructure to provide the library services. Due to the emerging trends and changing scenario, library considered its users as a consumer and it is widely accepted that quality in service can only help the libraries to retain current consumers and attract new ones. The other factors are also considerably improves the quality in services but the quality of resources and infrastructure can never be ignored. Therefore, each library needs to evaluate the quality of information resources and services periodically and take necessary action for betterment. Focusing above, the libraries under study have been examined in respect of information resources and services by measuring usage and users satisfaction in ICT environment.

2. METHODOLOGY:

The following methodology has been adopted to achieve the objectives set forth for the study.

2.1. Review of literature:

For the study purpose a preliminary survey of literature related to the topic published in different journals, books, reports, conference proceedings etc. and a bibliography was prepared accordingly. Secondly, the most relevant information, articles and documents were selected for detailed and in-depth study. Information available on institute web-sites was studied. The institute publications, i.e., annual report, prospectus, library guide etc. have been examined.

2.2. Survey and personal interview:

The methodology adopted for the study consisted of four stages, i.e. designing of questionnaires, filtration of institutions, gathering of information and data, analysis of data, and finding and preparing of report. The two questionnaires meant for librarians were designed and distributed for collecting the required data. The first questionnaire was preliminary to know the initial information about the library infrastructure initially required for conducting of study, i.e., number of computer systems, library automation status, OPAC, and digital resources, etc. The study has been restricted to two major universities of Delhi, i.e., University of Delhi (DU) and GGSIP University. The second structured questionnaire was designed and sent to selected libraries only to collect detailed data on library resources and infrastructure and services focused to their usage and users satisfaction from libraries perspective. Simultaneously, personal discussion with library professionals were conducted to draw their opinion on the above topic.

Table - 1 Name of the selected libraries

Sr.	Universities	Total	Number of libraries selected
1.	University of Delhi	02	02
2.	GGSIP University	49	06
	Total	51	08

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Selection of libraries:

After analysing the response of first questionnaire, the following eight libraries found eligible and have been selected for further study.

Table - 2 Name of the selected libraries.

Acronym	Status	Affiliation	Name of the Institute
BVCE	Private	GOSP	Bharati Vidyapeeth's College of Engineering
DCE	Govt.	DU	Delhi College of Engineering
GTBIT	Private	GOSP	Guru Tegh Bahadur Institutes of Technology
HMRIT	Private	GOSP	H M R Institute of Technology and Management
IGIT	Govt.	GOSP	Indira Gandhi Institute of Technology
MAIT	Private	GOSP	Maharaja Agrasen Institute of Technology
MSIT	Private	GOSP	Maharaja Sanjivani Institute of Technology
NSIT	Govt.	DU	Netaji Subhas Institute of Technology.

3. ANALYSIS AND INTERPRETATION OF DATA:

The second questionnaire was distributed among all eight selected libraries and collected the data filled in questionnaire from them. After collection of response, the data have been presented in tabular form, and further supplemented by graphs wherever necessary. The data have been excel and SPSS statistical techniques used for calculating average, percentage averages, ranking them in increasing or decreasing order and comparative statements of correlated facts and figures.

Table 3 - Usage statistics of Print and E-resources in percentage during the period

Resources	Print Resources				E-resources				Paired Samples Test						
	5	4	3	2	1	5	4	3	2	1	Mean for P-resources	Mean for E-resources	t	df	Sig. (2-tailed)
2004-05	4	3	1	0	0	0	1	2	2	3	4.38	2.13	9.000	7	.000
2005-06	3	2	2	1	0	1	1	2	2	2	3.75	2.63	1.838	7	.084
2006-07	2	2	2	0	2	2	2	1	1	3	3.30	3.38	.551	7	.588
2007-08	1	2	2	1	3	2	2	1	0	0	3.00	3.88	-1.986	7	.087
2008-09	1	2	2	2	1	4	2	2	0	0	3.00	4.25	-1.546	7	.058
Total	11	11	9	7	2	10	8	10	6	6	-	-	-	-	-

Usage statistics provided in (%) percentage, where rating 5 = 80-100, 4 = 60-79, 3 = 40-59, 2 = 20-39 and 1 = 1-19 during the years. The table number 7.30 shows the number of libraries evaluated their resources and assess the usage statistics in percentage. The most of the libraries shows their usage of print resources was very high during 2004-05 and very low during 2008-09. Opposite to the print, the digital resources were very low during 2004-05 and very high during 2008-09.

Paired sample t-test was conducted to compare the difference between Print and E-resources usage year wise. The result showed that there was a significant difference between the usages. The t-sample = 9000 in 2004-05, 1.938

in 2005-06, .552 in 2006-07, -1.986 in 2007-08, -2.546 in 2008-09, P for 2004-05 = .000 (at P< 0.05), .094 (at P< 0.10) for 2005-06, .598 (at P> 0.10) for 2006-07, .087 (at P< 0.10) for 2007-08 and .038 (at P< 0.10) for 2008-09. The degree of freedom (df) for each were 7. In one case the significant level (Sig. (2-tailed)) does not meet at P< 0.05 or P< 0.10 but it does not reflect that there is no difference. Such abnormal significant level is the result due to the less and limited number of data calculations. The major indicator of difference is the mean which has been carried out from the two relative variables. The mean difference for Print and E-resources usage year wise were 4.38 and 2.13 in 2004-05, 3.75 and 2.63 in 2005-06, 3.50 and 3.38 in 2006-07, 3 and 3.88 in 2007-08, 3 and 4.25 in 2008-09 proves that the usage of print resources were high than e-resources, but there is an increasing trend in E-resources usage but decline in print resources.

Table 4 - Features of computerization applicable in the libraries

Major Functions	BVCE	DCE	GTBIT	HMRIT	IGIT	MAIT	MSIT	NSIT	Mean
Circulation	✓	✓	✓	✓	✓	✓	✓	✓	1
OPAC search	✓	✓	✓	✓	✓	✓	✓	✓	1
Cataloging	✓	✓	✓	✓	✓	✓	✓	✓	0.88
Data input and output	✓	✓	✓	✓	✓	✓	✓	✓	0.88
Bar code	-	✓	✓	✓	✓	✓	✓	✓	0.75
Stock verification	✓	✓	✓	-	-	-	✓	✓	0.83
Serial control	-	✓	-	-	✓	✓	✓	✓	0.5
User library list	-	✓	-	-	✓	✓	✓	✓	0.38
Reservation process	✓	-	✓	✓	-	-	-	-	0.38
Budget management	✓	-	-	✓	-	-	-	-	0.25
Multi-media management	-	-	-	✓	✓	-	-	-	0.25
RFID	-	-	-	-	-	-	-	-	0
Full text database and dissemination	-	-	-	-	-	-	-	-	0
Total features	7	8	7	8	7	7	8	5	-

Based on the computerization function's score by the libraries divided into five categories, i.e., Not Automated = 0, Partially automated = 1- 4, Automated = 4 - 8, Fully automated = 9- 13, Highly automated = more than 13. Usability of computerization features has been arranged by mean value in decreasing order.

Table 5 - Features of Digital Library

Major Feature	DCE	IGIT	Mean
Auto E-mail mechanism	✓	✓	0.25
Compatibility to import and export the data	✓	✓	0.25
Online harvesting of data	✓	✓	0.25
Web based application	✓	✓	0.25
Link to other resources, OPAC etc	✓	-	0.13
CAI/PMH compliant	✓	-	0.13
Reports generation	-	-	0
Budget management	-	-	0
Usage statistics	-	-	0
Total	6	4	-

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Based on the digital library function's score by the libraries divided into five categories i.e. Not Developed = 0, Partially Developed = 1- 4, Developed= 4 - 8, Fully Developed = 9- 13, Highly Developed = more than 13. The above figure shows that only two libraries viz. DCE and IGIT are using digital library software and their features developed shows that their digital software are partially developed. Usability of digital library features has been arranged by mean value in decreasing order.

Table 6 – Features developed in Library Websites

Major Features	BVCE	DCE	GTBIT	HRMIT	MSIT	Mean
About library	√	√	√	√	√	0.63
Link to other libraries OPAC	-	√	√	-	-	0.25
Ask the librarian	-	√	-	-	-	0.13
Discussion forum	-	√	-	-	-	0.13
DDS (Document Delivery Service)	-	√	-	-	-	0.13
FAQ	-	√	-	-	-	0.13
Feedback from users	-	√	-	-	-	0.13
Internet search	-	√	-	-	-	0.13
Library blog	-	√	-	-	-	0.13
Online notice board	-	√	-	-	√	0.13
RSS feed	-	-	-	-	-	0.08
Search with in website	-	√	-	-	-	0.13
Source links (Twitter, Facebook etc)	-	√	-	-	-	0.13
Users guide	-	√	-	-	-	0.13
VLD (Virtual Reference Desk)	-	√	-	-	-	0.13
Usage statistics	-	-	-	-	-	0.08
Total	5	14	2	1	2	-

Based on the computerization function's score by the libraries divided into five categories, i.e., Not Developed = 0, partially developed = 1- 4, Developed 4 - 8, Fully Developed = 9- 13, Highly Developed = more than 13. The above figure shows that only five libraries viz. BVCE, DCE, GTBIT, HRMIT and MSIT are having websites but only DCE has highly developed website. Website features has been arranged by mean value in decreasing order.

Table 7. User education & orientation programmes and Reference & referral services'

Services	Manual Operated				ICT Enabled				Mean for Manual	Mean for ICT enabled	Sig. (2-tailed)	Sig. (2-tailed)	
	5	4	3	2	1	5	4	3					2
Circulation / lending service	0	3	3	0	0	4	1	1	0	3.38	4.38	0.002	0.002
User education and orientation programmes	3	4	1	0	0	3	2	0	0	4.25	4.12	0.164	0.303
Dissemination of Journals, databases, project reports etc.	0	0	0	0	2	3	0	0	0	2.12	4.62	0.000	0.000
Reference and referral service	0	1	2	0	0	2	2	2	1	0.12	4.08	0.000	0.000
Bibliography service	0	0	1	3	4	0	0	0	0	1.52	4.75	0.000	0.000
Document delivery service	0	1	2	3	1	5	0	0	0	2.25	4.52	0.002	0.002
Current awareness service	3	2	2	0	0	0	1	0	0	0.12	4.08	0.000	0.000
Selective dissemination service	0	1	2	2	3	2	2	0	0	2.12	4.12	0.000	0.000
Catalogue search	3	1	0	2	1	4	0	1	0	2.08	4.08	0.000	0.000
Total	0	20	21	20	12	30	20	9	1	-	-	-	-
	(11.11)	(31.41)	(29.14)	(22.22)	(25.00)	(34.72)	(34.72)	(11.11)	(1.11)	-	-	-	-
	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	-	-	-	-

* 3 = Excellent, 2 = Good, 1 = Average, 0 = Below Average, - = Poor

The table number 7 depicts that 'User education & orientation programmes and Reference & referral services' are rated 'Excellent' and 'Bibliography service and SDI' are rated 'Poor' services in manually operated environment by maximum number of libraries. Further the table depicts that 'Dissemination of Journals, databases, project reports, DDS and OPAC' are rated 'Excellent' and 'Reference and referral service' is rated 'Poor' services in ICT enabled environment by maximum number of libraries. Overall the figure shows the trend of maximum rating has been given to ICT enabled services.

Paired sample t-test was conducted to compare the difference between Manual and ICT enabled services satisfaction. The result showed that there was a significant difference between the two groups on satisfactions, except for two variables 'Users education and orientation programs' where $t = .314$ (with $P = .763$) (at $P > 0.10$) and 'Reference and referral service' where $t = 1.033$ (with $P = .336$) (at $P > 0.10$). The $t = -2.366$ for Circulation (with $P = .050$) (at $P < 0.10$), $t = -6.614$ for Dissemination of resources (with $P = .000$) (at $P < 0.05$), $t = -4.771$ for DDS (with $P = .002$) (at $P < 0.05$), $t = -7.850$ for Bibliography (with $P = .000$) (at $P < 0.05$), $t = -2.118$ for CAS (with $P = .072$) (at $P < 0.10$), $t = -3.191$ for SDI (with $P = .015$) (at $P < 0.05$), and $t = -2.291$ for Catalogue search (with $P = .056$) (at $P < 0.10$) and the degree of freedom (df) for each were 7. In two cases the significant level (Sig. (2-tailed)) does not meet at $P < 0.05$ or $P < 0.10$ but it does not reflect that there is no difference. Such abnormal significant level is the result due to the less and limited number of data calculations. The major indicator of difference is the mean which has been carried out from the two relative variables. The mean difference for Manual operated and ICT enabled services were 3.38 and 4.38 for Circulation, 4.25 and 4.12 for Users education, 2.12 and 4.62 for Dissemination of resources, 4.12 and 3.38 for RRS, 2.25 and 4.62 for DDS, 1.62 and 4.75 for Bibliography, 3.12 and 4.38 for CAS, 2.12 and 4.12 for SDI and 2.88 and 4.38 for Catalogue search proves that ICT enabled services are more satisfying than the Manual operated. Out of total nine (9) services, seven (7) ICT enabled services are more satisfying than print two (2) (i.e. Users education and RRS).

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Table 8 - Usage statistics of Print and E-resources in percentage during the period.

Resources Rating*	Print Resources					E-resources					Paired Samples Test				
	5	4	3	2	1	5	4	3	2	1	Mean for P-resource	Mean for E-resources	T	d f	Sig. (2- tailed)
2004-05	4	3	1	0	0	0	1	2	2	3	4.38	2.13	9.000	7	.000
2005-06	3	2	2	1	0	1	1	2	2	2	3.75	2.63	1.938	7	.094
2006-07	2	2	2	2	0	2	2	2	1	1	3.50	3.38	.552	7	.598
2007-08	1	2	2	2	1	3	2	2	1	0	3.00	3.88	-1.986	7	.087
2008-09	1	2	2	2	1	4	2	2	0	0	3.00	4.25	-2.546	7	.038
Total	11	11	9	7	2	10	8	10	6	6	-	-	-	-	-

Usage statistics have been provided in (%) percentage, where 5 – 80 – 100, 4 – 60 – 79, 3 – 40 – 59, 2 – 20 – 39 and 1 – 1 – 19 during the years. The table number 8 shows the number of libraries evaluated their resources and assess the usage statistics in percentage. The most of the libraries shows their usage of print resources was very high during 2004-05 and very low during 2008-09. Opposite to the print, the digital resources were very low during 2004-05 and very high during 2008-09.

Paired sample t-test was conducted to compare the difference between Print and E-resources usage year wise. The result showed that there was a significant difference between the usages. The t-sample – 9000 in 2004-05, 1.938 in 2005-06, .552 in 2006-07, -1.986 in 2007-08, -2.546 in 2008-09, P for 2004-05 = .000 (at P< 0.05), .094 (at P< 0.10) for 2005-06, .598 (at P> 0.10) for 2006-07, .087 (at P< 0.10) for 2007-08 and .038 (at P< 0.10) for 2008-09. The degree of freedom (df) for each were 7. In one case the significant level (Sig. (2-tailed)) does not meet at P< 0.05 or P< 0.10 but it does not reflect that there is no difference. Such abnormal significant level is the result due to the less and limited number of data calculations. The major indicator of difference is the mean which has been carried out from the two relative variables. The mean difference for Print and E-resources usage year wise were 4.38 and 2.13 in 2004-05, 3.75 and 2.63 in 2005-06, 3.50 and 3.38 in 2006-07, 3 and 3.88 in 2007-08, 3 and 4.25 in 2008-09 proves that the usage of print resources were high than e-resources, but there is a increasing trend in E-resources usage but decline in print resources.

Table 9 – Satisfaction Rate for manual and ICT Enabled general benefits.

Areas of benefits Rating*	Manual Operated					ICT Enabled					Paired Samples Test				
	5	4	3	2	1	5	4	3	2	1	Mean for Manual	Mean for ICT enabled	t	df	Sig. (2- tailed)
Communication	0	1	1	3	3	6	2	0	0	0	2.00	4.75	-6.068	7	.001
Enhance productivity and improve LIS Staff quality	1	2	2	3	0	4	3	1	0	0	3.12	4.38	-2.118	7	.072
Resource management	1	2	3	2	0	3	2	1	1	1	3.25	3.62	-.444	7	.670
Quality of services	2	2	2	2	0	3	2	2	1	0	3.50	3.88	-.482	7	.644
Resources safety	3	2	1	1	1	1	2	2	2	1	3.62	3.00	.637	7	.544
Resources sharing	1	1	2	2	2	4	2	1	1	0	2.62	4.12	-1.775	7	.119
Overall job performance	1	1	3	2	1	4	3	1	0	0	2.88	4.38	-2.291	7	.056
Total	9	11	14	15	7	25	16	8	5	3	-	-	-	-	-
	16.07%	19.64%	25%	26.78%	12.05%	44.64%	28.57	14.28%	8.92	3.57%					

* 5 – Excellent, 4 – Good, 3 – Average, 2 – Below Average, 1 - Poor

The table number 9 shows the area of benefits viz. 'Resources safety' is 'Excellent' and 'Communications' is 'Poor' in manually operated environment by maximum number of libraries. Further the table depicts that 'Communication' is rated 'Excellent' and 'Resource management & Resources safety' are rated 'Poor' benefits in ICT enabled environment by maximum number of libraries. Overall the figure shows the maximum rating to ICT enabled benefits. The comparative statement highlighted the benefits due to application of ICT. The communication (24 X 7, wider, remote and simultaneous

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access is least benefited area in manual operated but it most benefited area in ICT enabled. Overall indications for these benefits are (16.07%) as 'Excellent' and (12.05%) as 'Poor' in manually operated environment but (44.64%) as 'Excellent' and (3.57%) as 'Poor' in ICT enabled environment. The comparative statement shows that the benefits are much more in ICT enabled environment than the manually operated environment.

Paired sample t-test was conducted to compare the difference between Manual and ICT enabled general benefits satisfaction. The result showed that there was a significant difference between the two groups on general benefits satisfaction on three variables 'Communication' where $t = -6.068$ (with $P = .001$) (at $P < 0.05$), 'Enhance productivity and Improve LIS Staff quality' where $t = 2.118$ (with $P = .072$), (at $P < 0.10$) and Overall job performance - 2.291 (with $P = .056$), (at $P < 0.10$). And, there was no significant difference between the two groups on general benefits satisfaction on these variables Resource management where $t = -.444$ (with $P = .670$) (at $P > 0.10$), Quality of services where $t = -.482$ (with $P = .644$) (at $P > 0.10$), Resources safety $t = .637$ (with $P = .544$) (at $P > 0.10$), and Resources sharing $t = -1.775$ (with $P = 1.19$) (at $P > 0.10$). The degree of freedom (df) were 7 for each. In some cases the significant level (Sig. (2-tailed)) does not meet at $P < 0.05$ or $P < 0.10$ but it does not reflect that there is no difference. Such abnormal significant level is the result due to the less and limited number of data calculations. The major indicator of difference is the mean which has been carried out from the two relative variables. The mean difference for Manual operated and ICT enabled general benefits satisfaction were 2.00 and 4.75 for Communication, 3.12 and 4.38 for Enhance productivity and Improve LIS Staff quality, 3.25 and 3.62 for Resource management, 3.50 and 3.88 for Quality of services, 3.62 and 3.00 for Resources safety, 2.62 and 4.12 for Resources sharing, 2.88 and 4.38 for Overall job performance respectively proves that ICT enabled benefits are more satisfactory than the Manual operated. Out of total ten (7) benefits, six (6) ICT enabled benefits are more satisfying than print one (1, i.e., Resources safety).

4. Major Findings of the study:

Based on the result, the data revealed the following:

1. The usage of print resources was highest in 2004-05 and decline trend observed from 2004-05 to 2008-09. Overall, libraries observed that the print resources are having more usage than the e-resources. But the increasing trend in e-resources usage is seen.
2. The usage of digital resources have been observed least in 2004-05 but increase trend from 2005-06 to 2008-09 is observed.

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3. All libraries (100%) are using library management software to automate their library functions. Seven libraries (87.5%) out of eight are automated, only one (13.5%) is partially automated. The automation of library functions is the result of application ICT in libraries and changed the entire way of functioning. Automation based library services and functions such as circulation; search and retrieval of documents, acquisition, finance management, serial control, cataloguing, classification, report generation, usage statistics, stock verification are more satisfactory than the manually operated.
4. Only two libraries (25%) out of (8), i.e., DCE and IGIT have installed digital library software.
5. Five libraries (62.5%) out of (8) have designed and developed their library website and out of five, only DCE has highly developed website, rest four have partially developed websites.
6. As overall, in respect of satisfaction level, the ICT enabled services have been rated higher than the manually operated. The Bibliography service is the most satisfying service and RRS is the least satisfying service in ICT enabled environment.
7. In manually operated environment, the Users education & orientation programs (UBOP) and Reference and referral service (RRS) have been rated the most satisfying services and Bibliography preparation and Selective dissemination service are rated the least satisfying services.

5. Suggestions and Recommendations:

1. There has been a variation in the library and information resources of the institutes' libraries. Thus uniformity in course related resources should be stressed upon while building collection in libraries. The reference resources also needs to be procured as per the demand and advice of library reader.
2. The level of automation in libraries is not up to the mark and needs more up-gradation. The seven libraries are automated out of eight. One library is partially automated. But still there is need to focus more on automation.
3. The digital libraries in these institutions have not been developed so far except two, i.e., DCE and IGIT. It shows that most of the libraries has a lack of expertise.
4. The three institute do not have their libraries websites.

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Seven institute out of eight, except DCE are not having their library websites fully updated.

5. The older libraries, i.e., DCE, NSIT, IGIT, BVCE, etc. are more advanced and leading libraries in terms of building resources and adopting advance technologies in library functioning.
6. Several digital libraries, websites, e-mail groups, discussions forums, blogs etc. have been designed by the LIS professionals with a view to keep them abreast of the new development in rendering information services. To keep in mind of the changing dimension, information managers and facilitators have to equip themselves for discharging their duties in the ICT environment.
7. Professionals should install OSS (open source software) i.e. CMS (content management software), LMS (library management software), DLMS (digital library management software) and create platform to expand the OSS movement.
8. The application of ICT have given opportunity to spread information in new paradigm, many new web and internet tools available for this purpose, i.e., Subject or *Information Gateways*, News groups, Discussion forums, Listserv, E-mail forum, Message board or *Bulletin boards* for posting and updating of news, views and sharing professional information, participating in video conferences, chats, voice over IP, p2p networks, Instant Messaging, Pod and vodcast, Streaming Media, Blogging, Tagging, Search, Social book marking, SMS Enquiry Service, Social networking, wikis, and RSS are few leading web features which are being utilized frequently by the advance libraries.
9. It has been observed that the usage of digital resources should be enhanced more and users group, i.e., students, faculty and other staff should be trained to utilize the resources maximum. The users orientation and training programmes should be organized on regular and periodic basis.
10. The LIS professionals should work with the teaching fraternity and have to participate in education and learning programmes of the organization. The students should encourage designing their assignments and projects based on the information resources available with their library. A collaborative participation of faculty, student and librarian can ensure the maximum utilization of library resources and services and justify the money spent on subscription of these resources.

6. Conclusion:

The most of the libraries are under the phase of transition of change and it is necessary to evaluate the library resources and services by measuring their usages. The new users community have been emerged which is more aggressive in terms of their expectations and desire for

instant receipt of information and library services. It is therefore library professionals needs to be more updated in terms of awareness about the availability of primary and secondary information resources and their sources, new search techniques in internet age, utilize the latest tools and technology in organizing and dissemination of information. Application of ICT have fasten the process of library activities and function in each sphere and organization expects more from faculty and research fraternity, faculty and research fraternity expects more from library professionals, and being the ultimate service provider, the library professionals have to accept this challenge by applying the latest tools to ensure prompt and quality delivery of library services. The evaluation of library and information resources by measuring their usage and finding the level of user's satisfaction has become unavoidable to improve the library services in ICT age.

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