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## USE OF ICT AT ENGINEERING COLLEGE LIBRARIES IN MAHARASHTRA STATE : AN ANALYTICAL STUDY

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### Abstract

*The present study highlights the use of Information Communication Technology at the degree engineering college libraries in Maharashtra State. Efforts were made to know the availability of hardware , status of library automation at these engineering college libraries . The paper also highlights on the availability of internet connectivity , digital library facilities and barriers in the application of ICT are also discussed .The results of the study shows that majority of the libraries were effectively using Information Communication Technology .*

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### KEYWORDS :

Engineering College Library, Information Communication Technology, Library Automation, Digital library, Barriers in ICT Application.

### 1. INTRODUCTION:

The last few decades are the witnessed the increasing impact and use of Information Communication Technology for the functions & services of library. Information Communication Technology has become an integral part of all the aspects of library. A good and proper implementation of ICT in library results into better resource sharing and more effective services to the users. According to ILA Glossary – “ ICT is the application of the computers & other technologies to the acquisition , organization ,storage ,retrieval & dissemination of information.” Libraries are expected to use ICT to provide information more quickly. The fourth law of Library Science – “Save the time of reader/staff” has great relevance in the context of use of ICT. Considering the increased impact of ICT on libraries, AICTE also developed the norms for the use of ICT at engineering college libraries . The researcher tried to find out how the engineering college libraries in Maharashtra State implemented ICT in their routine activities and services also.

### 2. REVIEW OF LITERATURE :

#### Use of the Information Communication Technology :

The literature on use of ICT in academic libraries/engineering college libraries is summarized under the following sub headings-

## 2.1 ICT implementation :

Sheikhshoaei and Oloumi (2011) studied the determinant factors in the acceptance of information technology (IT) by librarians in the libraries of engineering faculties of public universities in Tehran with the Technology Acceptance Model (TAM) as the research framework. Findings indicated that all independent variables in the framework of TAM affected the acceptance of IT, but the final results ( $R=0.033$  for Model) indicated that the applicability of the TAM model to study this group is weak.

Barik, Das and Ramesh (2011) examined the scenario of ICT application in the private engineering and management colleges in Orissa. Discussions were also held on the subject of the barriers in an effective ICT implementation.

Pragasam (2011) surveyed the libraries of the engineering college affiliated with the University of Mumbai, with a special reference to ICT application. The results of this study shows that majority of the engineering college libraries affiliated to University of Mumbai has successfully implemented ICT applications.

Dhanavandan S. (2010) highlighted on the Information Communication Technology infrastructures in the engineering college libraries in Tamil Nadu. The study traces out the nature of the library automation level, computerized library services, electronic access points, type of digital libraries, network and topology of network, internet and the intranet services and so on with reference to the selected institutions. Sampath and Biradar (2010) examined the use of Information Communication Technology (ICT) in 31 college libraries in Karnataka, India by investigating the ICT infrastructure, current status of library automation, barriers to implementation of library automation and also the librarians' attitudes towards the use of ICT.

Haneefa (2007) examined the current state-of-the-art ICT infrastructure and the use of the electronic information resources in special libraries in Kerala. Although the special libraries in Kerala have hardware, software and communication facilities to some extent, the ICT based resources and services are not reaching the users to the expected extent. This has severely affected the provision of ICT based resources and services.

Patkar (2004) discussed the impact of information technology on libraries and how they can best adapt it. Author revealed that the profound changes brought about by information technology throughout the whole information management sector were posing numerous challenges for libraries, and their very survival as traditionally identified was even questioned in some quarters. He concluded that the basic functioning of the library is bound to change.

Gulati (2004) discussed the status of information and communication technologies in the context of Indian libraries with special reference to special libraries and the efforts made by various institutions to propagate e-information products and services. The author also highlighted on the challenges posed by Information Communication Technology in front of library professionals and an overview of initiatives taken by Government of India.

Singh, (2001) highlighted on the present state of computerization in six IIT libraries (Bombay, Delhi, Guwahati, Kanpur, Kharagpur and Madras). The different aspects covered are hardware, software, applications, databases, CD-ROMs, online search services, networking and marketing of products and services.

Dave and Sharma (2000) examined the changing scenario of libraries with special reference to India and the application of information technology during the last decade of the 20th century. Author concluded that various IT gadgets likely to affect the library and information activities.

Davarpanah (2001) assessed the IT application as a complex process involving many inter-related technological and non-technological factors, some related to the library, other to the information technology itself and the society. The author outlined a variety of technological, managerial, personnel, economical, socio-cultural and governmental factors that were likely to affect the IT application in libraries in the developing countries. He concluded that in building up the IT infrastructure, all these factors should be taken into consideration

## 2.2 Library Automation:

Hambarde Govind (2011) has highlighted on the scenario of library automation in the

engineering colleges of Maharashtra state. Bhalekar, Dipak (2011) discussed the various steps involved in the process of the library automation with a special reference to Babasaheb Nail College of Engineering Library, Pusad (M.S.). Mulla and Chandrashekara (2009) tried to identify the status of the library automation in the engineering college libraries of Karnataka state. Abdul Azeez (2004) discussed the library automation system of TKM College of engineering. S. Dhanavandan (2010) conducted a survey on the use of the library automation software in self financing the engineering college libraries of Tamilnadu State.. K.R. Mulla, M. Chandrashekara and V.G. Talawar (2010) focused on the usage and performance of various library software modules in the engineering colleges of the Karnataka State. K. R. Mulla (2009) studied the use of integrated library software (ILS) in engineering college libraries of Karnataka. The study was carried out on the selected engineering college libraries of Bangalore region, to explore the satisfaction level of software users and to find out their problems and suggestions.

### 2.3 Use of Internet:

S. Arya and K. Talukdar, (2010) studied the use and effectiveness of the internet services and resources in the Delhi College of Engineering Library in India. S. S. Padnzamma, Radhika, and Sunitha (2010) examined the information seeking behavior of the undergraduate students in the Engineering college libraries. Major findings from the study showed that the academic information was rated as the predominant information required by the students, while the internet was rated as the most crucial source for most of the academic information required. Sanjeev Sharma and Deepak Khera (2009) carried out a study on the use of Internet among teachers and students in engineering colleges of Kurukshetra District, Haryana, India. Kaur and Manhas (2008) surveyed the use of Internet services and resources in the engineering colleges of Punjab and Haryana states of India. Lohar and Kumbar (2008) surveyed 110 undergraduate and post-graduate (BE) Students of different disciplines regarding the use of Internet and CD-ROM at Jawaharlal Nehru National College of Engineering Library, Shimoga (Karnataka).

Kumar and Kaur (2006) demonstrates and elaborates the various aspects of Internet use among the teachers and the students of engineering colleges in India's three States viz. Punjab, Haryana and Himachal Pradesh. Rajeev Kumar and Amritpal Kaur (2005) studied the use of the Internet in the Engineering colleges of Punjab, India. Kumar, R., and Kaur (2004) examined the use of Internet by teachers and students in Shaheed Bhagat College of Engineering and Technology in India. Kumbar and Shirur (2003) conducted a survey at Sree Jayachamrarjendra college of Engineering (SJCE) regarding the exploitation of Internet resources.

Tadasad, P. G. , Maheswarappa, B. S. & Alur, Seema Alur (2003) examined the use of Internet by the undergraduate students of P.D.A College of Engineering Gulbarga (Karnataka State). The results of the study shows that a majority of the undergraduate students were using internet for academic purpose.

### 2.4 Digital Library:

As per AICTE (2012) approval process handbook , it is mandatory that the engineering college libraries should have a Digital Library with multimedia facility.

Yekanath Ningappa, K. K., Raghavendra, S. S., and Gandhi, R. (2010) undertook a study to highlight the present developments in Information and Communication Technologies (ICT) and their impact on the users community in engineering and other technological libraries, with a special reference to the R.V. Engineering College Bangalore. The authors have concluded that the present digital technologies have made a drastic impact on users' needs.

### 2.5 Library Consortia:

Bibhuti , Sahoo and Gopal Agarwal (2012) threw light on the various operational consortia in India, with a special emphasis on INDEST-AICTE Consortium. The inception of INDEST-AICTE consortium, objectives administrative structure, services and activities are also discussed therein. Nagaraja, Gangadhar and Vasanthakumar (2011) tried to identify the collection development of electronic resources through INDEST-AICTE, to predict the most required and useful model for the engineering college libraries of India.

Jagdish Arora and Kruti Trivedi (2010) threw a light on the services of INDEST-AICTE consortium. The authors elaborated the strategies used for effective implementation of consortia

amongst member institutions and touched upon the economics of the consortium, spelling out the future endeavors.

Kshyanaprava Sahoo and Jeevan (2005) evaluated the search facilities and the search results of major resources. i.e. ACM Digital library, IEEE/IEE Electronic library, Science Direct of Elsevier and Springer Link to make a comparative assessment of the key features and the quantity of the records.

Maitrayee Ghosh and Ashok Jambhekar (2003) explored the possibilities of establishing the Management and Engineering library consortia of two western Indian states i.e. Gujarat and Maharashtra. The authors focused on the joint purchase of the resources by IIT Mumbai, IIM Ahmedabad and the other engineering and Management institute libraries of the region.

## 2.6 Library Website

Gloria (2012) discussed the model of library website for mobile phone users of a University library. Ratha, Joshi and Naidu (2012) analyzed the design and structure of the library websites of IITs. Significant differences were found regarding the user supporting services, the number of hyperlinks on home pages, the number of images, location of the images, inactive links etc. Finally the authors suggested the design and structure for the IIT Library websites.

B. Pradip Balaji and Kumar Vinit (2011) assessed the library websites of the South Indian Technology Universities as a primary platform and one-stop portal for information services and effectiveness of library websites in providing web-based information services. Kannappanavar, Jayprakash and Bachalpur (2011) analyzed the content of the engineering college libraries in Tumar district. The findings of the study indicated that the engineering college libraries were not maintaining a separate Library website and limited information was provided through their institute's website. Konnur, Rajani and Madhusudhan (2010) evaluated the websites of five academic libraries in terms of the efficiency of information retrieval, online reference desk assistance, computer graphics and overall ease of use of the websites.

Manzari and Trinidad- Christensen (2006) discussed the library web site creation with a user-friendly design. Findings of the study based on a heuristic evaluation and usability study were applied in an interactive redesign of the site to better serve the needs of the special academic library population. Discussion on the design of webpage in accordance with the web based library services was also made.

Osorio, Nestor (2000) identified the trends in the design and content of the website homepages of the science-engineering libraries. The author revealed that the current design of homepages for science and engineering libraries generally contained many of the elements found in the homepages of the academic libraries.

## 2.7 Web OPAC :

Madhusudhan and Aggarwal (2011) evaluated the various features of web-based OPACs in six IIT libraries (IIT Delhi, IIT Bombay, IIT Madras, IIT Kanpur, IIT Guwahati, and IIT Roorkee). The results of the study indicated that some web-based OPACs reached the maximum scores for some categories. The results also indicated that VTLS-based and LibSys-based OPACs had the higher score on average (74.7%) and the IIT Klas-based OPAC of IITK received the lowest score of 44.2%. None were rated excellent. Only 50% of the web-based OPACs studied achieved an above average ranking, of which Indian Institute of Technology, Madras (IITM) had the highest total score (131) and the Indian Institute of Technology, Kanpur (IITK) had the lowest total score (77). Almost all the web OPACs under study lacked federated search, adjunct thesaurus help and spell check facilities, which seems to raise many questions regarding the facilities provided in the OPAC 2.0 environment of today and hence needs to be addressed as a priority in the subsequent generations of the web-based OPACs and their development.

Mulla and Chandrashekara (2009) attempted to know the use of web-OPAC by the library users of engineering college libraries. The study revealed that the Web-OPAC is a useful tool and at the same time respondents felt that there must be user orientation needed for the Web-OPAC, to help in retrieving the required documents. Authors examined the utilization and satisfaction of users about Web-OPAC and provided the suggestions made by the users for the further improvement.

Kapoor, K., and Goyal, O. P. (2007) analyzed the functionality of the five web-based OPACs available in the Indian academic libraries. Their functionality was compared by using criteria selected

from the literature on OPAC searching. The web-based OPACs, when investigated by the author, appeared to offer a range of facilities for searching, title and the control number by keywords. Federated searching across several e-collections was limited.

#### 1. Distribution of Colleges by Management:

In Maharashtra state, up to 2006-07, there are only five (5) engineering colleges, run purely by the State Government, whereas one college is aided and four colleges are autonomous; but as they receive funds from the state Government, the researcher has included these 10 colleges in the Aided Category, whereas the engineering colleges / institutes which are self-financing, are considered under Unaided Category. The data regarding the responses received from the colleges by the management is shown in Table-1.

**Table 1**  
**Distribution of Colleges by Management**

Category	Total Colleges	Response Received	%to Total Colleges
Aided	10	07	70
Unaided	138	79	57.2
Total	148	86	58.1

It is clear from the table 1 that the response received from unaided colleges is very low. Most of the unaided colleges did not respond to the questionnaire delivered by the researcher. In spite of the researcher's attempt to collect the data with a letter from the Directorate of Technical Education of Maharashtra State, the response from the engineering colleges has been as poor as 70 % from aided colleges and just 57.2 % from unaided colleges. Aggregate response from the population of Libraries had been just over 58%.

#### 4. USE OF INFORMATION COMMUNICATION TECHNOLOGY AT ENGINEERING COLLEGE LIBRARIES :

##### 4.1 Availability of Hardware:

The researcher has investigated the availability of hardware. Table 2 indicates the data collected on availability of hardware from the libraries of the surveyed engineering colleges and Table 2 indicates the results of the independent sample test for availability of the hardware.

The table shows the availability of server across aided and unaided colleges. 100% of the libraries in case of aided colleges and 87.3 % of the libraries in case of unaided colleges were having the servers. The average quantity of servers was 1.57 in case of aided colleges and 1.12 in case of unaided colleges.

**Table 2**  
**Availability of Hardware**

Category of the College	Server : Availability	Qty . (Average)	Laser Printer: Availability	Qty . (Average)	Scanner Availability	Qty . (Average)	UPS: Availability	Qty. (Average)	Barcode Printer: Availability	Qty. (Average)	Barcode Scanner: Availability	Qty: (Average)
<b>Aided</b>	7 (100)	1.57	7 (100)	1.71	6 (85.7)	1.33	7 (100)	2.29	1.14	1.4	1 (14.3)	2.83
<b>Unaided</b>	69 (87.3)	1.12	76 (96.2)	1.24	63 (79.8)	1.11	68 (86.1)	2.63	1.0	1.0	11 (13.9)	2.06

Figures in the table shows that 100 % of the libraries in case of aided colleges and 96.2 % of the libraries in case of unaided colleges were having the laser printers. The average quantity of laser printers

was 1.71 in case of aided colleges and 1.24 in case of unaided colleges.

It has been seen that 85.7 % of the libraries in case of aided colleges and 79.8 % of the libraries in case of unaided colleges were having the scanners. The average quantity of scanners was 1.33 in case of aided colleges and 1.11 in case of unaided colleges.

It is observed that 100 % of the libraries in case of aided colleges and 86.1% of the libraries in case of unaided colleges were having the UPS. The average quantity of scanners was 2.29 in case of aided colleges and 2.63 in case of unaided colleges.

Figures in the table reflects that 71.4 % of the libraries in case of aided colleges and 74.7 % of the libraries in case of unaided colleges were having the barcode printer. The average quantity of barcode printers was 1.14 in case of aided colleges and 1 in case of unaided colleges.

It has been also seen that 14.3 % of the libraries in case of aided colleges and 13.9 % of the libraries in case of unaided colleges were having the barcode scanners. The average quantity of barcode scanners was 2.83 in case of aided colleges and 2.06 in case of unaided colleges.

#### 4.1.1 Availability of Hardware: Independent sample test:

**Table 3**  
**Availability of hardware: Independent sample test**

Parameters	Levine's Test for Equality of variances		t-test for Equality of Means					95 Confidence Interval of the Diff.	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Server Availability	5.71	0.02	1.46	84	0.148	0.18445	0.12632	-0.0668	0.4356
			0.983	6.418	0.361	0.18445	0.18756	-0.2674	0.6363
Laser printer Availability	1.17	0.28	-0.52	84	0.605	-0.03797	0.0731	-0.1833	0.1074
			-1.76	78	0.083	-0.03797	0.02164	-0.0811	0.0051
Scanner Availability	1.11	0.3	0.604		0.547	0.09584	0.15856	-0.2195	0.4112
			0.505	6.714	0.63	0.09584	0.1897	-0.3566	0.5483
UPS Availability	6.3	0.01	-1.05	84	0.296	-0.13924	0.1324	-0.4025	0.1241
			-3.55	78	0.001	-0.13924	0.0392	-0.2173	-0.0612
Barcode printer Avail.	2.13	0.15	1.088	84	0.28	0.18807	0.17289	-0.1557	0.5319
			0.905	6.707	0.397	0.18807	0.20775	-0.3076	0.6837
Barcode scanner Availability	0.12	0.73	0.629	84	0.531	0.28571	0.4542	-0.6175	1.1889
			1.255	13.66	0.231	0.28571	0.22774	-0.2039	0.7753
			1.535	6.635	0.171	0.53526	0.34875	-0.2987	1.3692

The independent-samples t test tests the significance of the difference between two sample means. Based on the Levene statistic test, for server availability and UPS availability the p-value were 0.361 and 0.001 respectively. This shows that the mean of UPS Availability across aided and unaided colleges differed significantly.

The t statistics without equal variances assumed were considered for the analysis with regards to all the other variables.

For Laser printer Availability, Scanner Availability, Barcode printer Availability, Barcode scanner Availability, the t values being not significant (p-value>0.05) this can be concluded that these variables did not vary significantly across aided and unaided colleges.

#### 4.2 Status of Library Automation:

The researcher tried to know the status of automation from the libraries of the surveyed engineering colleges. Data collected on this aspect are presented in Table 4. Figures in the table reflect that major status of library automation was partial automation in almost all the processes, across aided and unaided colleges.

**Table 4**  
**Status of Library Automation**

Category of the College	Acquisition			Cataloguing			Circulation			Serial Control			Budget Control		
	full y	parti al	In proce ss	full y	parti al	In proce ss	full y	parti al	In proce ss	full y	parti al	In proce ss	full y	parti al	In proce ss
Aided	1 (7.7 )	6 (92.3)	0 (0)	1 (14.3)	6 (85.7)	0 (0)	1 (7.6 9)	6 (92.3)	0 (0)	0 (0)	5 (71.4)	2 (21.4)	0 (0)	5 (71.4)	2 (21.4)
Unaided	27 (33.6)	44 (55.7)	8 (10.7)	28 (35.4)	47 (59.5)	4 (5.1)	16 (20.7)	55 (69.6)	8 (9.6)	25 (31.3)	37 (46.9)	17 (21.8)	23 (28.8)	36 (45.5)	20 (25.8)
Total	28	50	8	29	53	4	17	61	8	25	42	19	23	41	22

The researcher tried to summarize the status of automation from the libraries of the surveyed engineering colleges. Data analyzed on this aspect are presented in Table 4.4

**Table 5**  
**Summary of Status of Library Automation**

Category of the College	Overall			
	Fully	Partial	In process	Total
Aided	1 (20)	6 (80)	0 (0)	7 (100)
Unaided	35 (44)	38 (48)	6 (8)	79 (100)
Total	36 (41.9)	44 (51.2)	6 (6.9)	86 (100)

It is clear from the above table that out 86 surveyed libraries only 36 libraries (41.9%) were fully automated their in-house operations with the help of library management software where as majority (51.2%) of the libraries replied that their libraries were partially automated their in-house library operations. More number of libraries in case of unaided colleges were fully automated their in house library operations when compared to aided colleges. Also figure 4.11 presents the status of library automation.

#### 4.3 Internet connectivity in library

Efforts were made to know the number of libraries having internet connectivity. Table 6 contains data regarding Number of libraries having internet connectivity in the surveyed engineering colleges.

Figures in the table indicates that all the libraries in case of aided colleges and 97.5% of the libraries in case of unaided colleges had the internet connectivity in their libraries.

**Table 6**  
**Internet connectivity in library**

Category of the College	Internet connectivity		
	Yes	No	Total
Aided	7 (100)	0 (0)	7 (100)
Unaided	77 (97.5)	2 (2.5)	79 (100)
Total	84 (95.4)	2 (4.6)	86 (100)

#### 4.4 Digital Library :

Efforts were made to know about the number of libraries having a digital library. Table 7 contains data regarding Number of libraries having a digital library in the surveyed engineering colleges.

**Table 7**  
**Digital Library**

Category of the College	Facility of Digital Library		
	YES	NO	Total
Aided	4 (55.6)	3 (44.4)	7
Unaided	35 (44.4)	44 (55.6)	79
Total	39	47	86

Figures in the table reflects that 55.56% of the libraries in case of aided colleges and 44.44% of the libraries in case of unaided colleges were having a digital library facility in their libraries.

#### 4.5 Types of digital library :

The researcher tried to know the type of digital libraries in the surveyed engineering colleges. Data collected on this aspect is presented in Table 8.

**Table 8**  
**Type of Digital Library**

Category of the College	Type of digital library			Total
	Developed by your own institute	Subscribing to digital resources	Developed by own institute and subscribing to digital resources	
Aided	2 (22.3)	3 (44.4)	2 (33.3)	7 (100)
Unaided	4 (5.2)	63 (79.2)	12 (15.6)	79 (100)
Total	6 (7)	66 (76.7)	14 (16.3)	86 (100)

It is clear from the above table that 44.4 % of the libraries in case of aided colleges and 79.2 % of the libraries in case of unaided colleges were having subscription of digital resources. About 33.3 % of the libraries in case of aided colleges and 15.6 % of the libraries in case of unaided colleges had the digital libraries developed by their own institute and subscribing to digital resources. However, the share of aided colleges in developing their own digital Library is much greater than unaided colleges.

#### 4.6 Membership of e- Journals Consortium and Type Of Consortium :

The researcher attempted to find out whether the library has membership of e- journals consortia. Table 9 indicates the data collected on whether the library has membership of e- journals consortia from the libraries of the surveyed engineering colleges.



**Table 9**  
**Membership of e- journals Consortia and Type of Consortia**

Category	Membership of e-journals			Type of Consortia			
	Yes	No	Total	INDEST	J GATE	IEEE	Total
Aided	5 (71.5)	2 (28.5)	7 (100)	5 (100)	0 (0)	0 (0)	5 (8)
Unaided	54 (68.1)	25 (31.9)	79 (100)	46 (84.7)	4 (8.3)	4 (6.9)	54 (92)
Total	59 (68.6)	27 (31.4)	86 (100)	51 (86.4)	4 (6.8)	4 (6.8)	59 (100)

Figures in the table shows that majority 71.5% and 68.1% of the libraries in case of aided and unaided colleges respectively were having the membership of e-journal consortium. INDEST-AICTE consortium was the most preferred consortium by both the libraries.

#### 4.7 Separate Library Webpage:

The researcher tried to know whether the library was having a separate webpage in the surveyed engineering colleges. Data collected on this aspect it may be pointed out that only a single unaided college library reported separate webpage of the library. Response of remaining colleges to this activity is rather cold.

#### 4.7.1 Library having link in the Institute's website:

The researcher tried to investigate whether the libraries were having a link in the Institute's website across aided and unaided colleges. The data on this aspect is collected and presented in the table 10.

**Table 10**  
**Library having link in the Institute's website**

Category of the College	Yes	No	Total
Aided	7 (100)	0 (0)	7 (100)
Unaided	43 (54.9)	36 (45.1)	79 (100)
Total	50 (58.1)	36 (41.9)	86 (100)

It is clear from the above table that in case of aided colleges, all the libraries' WebPages were having a link in the Institute's website, whereas in case of unaided colleges, 54.9% of the libraries WebPages having a link in the Institute's website.

#### 4.8 Web – OPAC :

The researcher tried to know whether the library hosted a web – OPAC on library webpage from the libraries of the surveyed engineering colleges. Data collected on this aspect are presented in Table 11.

**Table 11**  
**Web – OPAC**

Category of the College	Web – OPAC		
	YES	NO	Total
Aided	2 (27.27)	5 (72.73)	7
Unaided	8 (10.49)	71 (89.51)	79
Total	10	76	86

Figures in the table reflects that in case of aided colleges, 27.27% of the libraries hosted a web – OPAC, whereas in case of unaided colleges, 10.49% of the libraries hosted web-OPAC. It seems that this is just a beginning and sure to grow over time.

#### 4.9 Real Time Service (Digital Reference Service) :

Efforts were made to know whether the library providing Real Time Service (Digital Reference Service) where users can directly interact with Librarian/Reference Librarian to fulfill their queries. Table 12 contains data regarding whether the library providing Real Time Service (Digital Reference Service) where users can directly interact with Librarian/Reference Librarian to fulfill their queries from the libraries of the surveyed engineering colleges.

**Table 12**  
**Real Time Service (Digital Reference Service)**

Category of the College	Real Time Service (Digital Reference Service)		
	Yes	No	Total
Aided	1 (16.7)	6 (83.3)	7 (100)
Unaided	10 (12.9)	69 (87.1)	79 (100)
Total	11 (12.8)	75 (87.2)	86 (100)

It is clear from the above table that in case of aided colleges, 16.7 % of the libraries provided & in case of unaided colleges, 12.9 % of the libraries were providing Digital Reference Service to their users. It seems that this activity is also a recent beginning and we can hope it will grow over time.

#### 4.10 Barriers in ICT Application

The researcher attempted to find out the main barriers in the effective application of ICT in libraries. Table 13 indicates the data collected on main barriers in the effective application of ICT in libraries of the surveyed engineering colleges.

**Table 13**  
**Barriers in ICT Application**

<b>Barriers in ICT application</b>	<b>Aided</b>	<b>Unaided</b>
Lack of Funds	-	1 (1.8)
Unskilled Manpower	-	7 (9.5)
Non Availability of Less Expensive Library Management Software	1 (7.9)	-
Increasing Cost of Hardware and Software	-	2 (2)
In Adequate ICT Infrastructure	-	4 ( )
Lack of Funds and Unskilled Manpower	4 (63.2)	35 (44.9)
Lack of Funds and Unskilled Manpower and Non Availability of Less Expensive Library Management Software	-	1 (1.8)
Lack of Funds and Non Availability of Less Expensive Library Management Software	-	5 (6)
Lack of Funds and Increasing Cost of Hardware and Software and Inadequate ICT Infrastructure	2 (23.7)	24 (29.1)
<b>Total</b>	<b>7</b>	<b>79</b>

Figures in the table reflect that in case of aided colleges, 63.16% was lack of funds and unskilled manpower, whereas in case of unaided colleges, it was 44.89%. In 23.68% of aided colleges and 29.18% of unaided colleges, lack of funds and increasing cost of hardware and software and inadequate ICT infrastructure was the second largest barrier in ICT application.

#### **RESULTS OF THE STUDY:**

- 1.All the surveyed libraries were having an average good availability of hardware.
- 2.Major status of library automation was partial automation in almost all the processes, across aided and unaided colleges.
- 3.Result shows that 100% of the libraries in case of aided colleges and 97.50% of the libraries in case of unaided colleges had the internet connectivity in their libraries. 49. All the aided college libraries and more than 50 % unaided college libraries were using internet for library operations and services.
- 4.It has been seen that 55.56% of the libraries in case of aided colleges and 44.44% of the libraries in case of unaided colleges were having the facility of digital library .
- 5.In case of aided colleges, 68.6% of the libraries in aggregate had membership of e- journals. Membership of aided colleges was marginally higher at 71.5 % as against those of unaided colleges at 68.1 %n. INDEST is the most popular consortia among sample colleges to which all the aided colleges and 84.7 % of unaided colleges preferred for membership.
- 6.Only a single unaided college library reported separate webpage of the library. Response of remaining colleges to this activity is rather cold.
- 7.In case of aided colleges, all the libraries' WebPages were having a link in the Institute's website, whereas in case of unaided colleges, 54.9% of the libraries WebPages having a link in the Institute's website.
- 8.In case of aided colleges, 27.27% of the libraries hosted a web – OPAC, whereas in case of unaided colleges, 10.49% of the libraries hosted web-OPAC. It seems that this is just a beginning and sure to grow over time.
- 9.In case of aided colleges, 16.7 % of the libraries provided, whereas in case of unaided colleges, 12.9 % of the libraries were providing Real Time service (Digital Reference Service). It seems that this activity is also a recent beginning.

10. In case of aided colleges, 63.16% was lack of funds and unskilled manpower, whereas in case of unaided colleges, it was 44.89%. In 23.68% of aided colleges and 29.18% of unaided colleges, lack of funds and increasing cost of hardware and software and inadequate ICT infrastructure was the second largest barrier in ICT application.

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