Indian Journal of Information Science and Services

IJISS is a refereed research journal published half-yearly by the Learning Resource Centre, Bannari Amman Institute of Technology. Responsibility for the contents rests upon the authors and not upon the IJISS. For copying or reprint permission, write to Copyright Department, IJISS, Learning Resource Centre, Bannari Amman Institute of Technology, Sathyamangalam, Erode District - 638 401, Tamil Nadu, India.

From the Editor-in-Chief's Desk

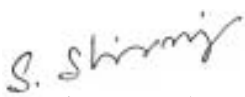
Research in library science is a twentieth century occurrence ushered in by the Library School of the University of Chicago in mid-1920s. The visionary efforts of the Chicago School bore abundant fruit and offered leadership to the world in library science research. Professional higher education in Library and Information Science (LIS) in India, now nine decades old, is centred in universities. Today about 50 Universities have facilities for doing doctoral degree programme in Library Science.

The credit for the formal institution of the doctoral degree programme in library science in India goes undeniably to Dr. S.R. Ranganathan (1892–1972). In 1951, he started one at the University of Delhi surmounting many difficulties and facing personal ridicule. The University of Delhi awarded the first de jure degree in library science in 1957 to D.B. Krishan Rao who worked on a faceted classification for agriculture.

The mantle of reviving and furthering doctoral research facilities was assumed by J. S. Sharma (1924–1993), then the university librarian and head of the library science department of the Panjab University, Chandigarh. Under his guidance the second de jure Ph.D. in library science was awarded in 1977 after a gap of two decades. Thereafter, there was no looking back. Many universities followed with mostly individual efforts and enthusiasm. Doctoral research got a fillip in the 1980s. Programmes for Ph.D. research have been introduced and expanded enormously. The pace of library research is picking up everywhere today due to social pressure as well as inspiration.

The Bannari Amman Institute of Technology is an institute of higher learning in Engineering and Research. To commemorate the 10 years of its completion, the Learning Resource Centre has planned to bring out a refereed research journal entitled ***Indian Journal of Information Science and Services (IJISS)*** *- a half-yearly publication on Library Science. One of the objectives of the Indian Journal of Information Science and Services is to disseminate knowledge on various research issues connected with Library Science. The journal has received an overwhelming response from the Library Science professionals and researchers all over India. We plan to reach this issue to various personalities, academicians and researchers connected with Library and Information Science to make this a top-class refereed journal.*

The Editorial Board is keen on receiving suggestions for further improvement of the journal as this being the first issue and will appreciate any constructive suggestions from the readers.



(S.Sivaraj)
Editor-in-Chief, IJISS

Indian Journal of Information Science and Services

CONTENTS

A SCIENTOMETRIC ANALYSIS OF RESEARCH JOURNALS ON CARDIOLOGY IN G8 COUNTRIES

Dr.M.Sadik Batcha[1] and C.Baskaran[2]
[1]Reader, Department of Library and Information Science, Annamalai University, Tamil Nadu
[2]Deputy Librarian, Central Library, Alagappa University, Tamil Nadu
E-mail: cbaskaran1972@yahoo.com
(Received on 14 June 2007 and accepted on 06 August 2007)

Abstract

This research is to analyse the publication activity of G8 Countries on Cardiology output of USA, UK,Japan, Italy, Germany, France, Canada, and Russia. Most of the prolific institutions are located in G8 Countries and produced 13028 records in the period from 1964 to 2006. This research based on MEDLARS database which has been published by the National Library of Medicine. The publication of journals scattering among G8 countries, first placed of Journal of American College of Cardiology produced highest output(8%) followed by Circulation (6.5%). The leading Institutions contributing publication in G8 countries and the outputs are Massachusetts Medical School,Worcester,USA(220), University College London, Grafton ag, UK (196), Justus-Liebeg University of Gissen, Germany(167), Institute of Clinical Physiology Pisa, Italy(138),University Hospital of Anger, France (124), University of Torondo, Canada(112), Jubetendo University School Medicine Tokyo, Japan(72) and Russian Academy of Medical Science Moscow, Russia(56).

Index Terms: *Scientometric analysis, Impact factor, Leading institutions and Collaboration of cardiology journals*

1. INTRODUCTION

In today's modern technological world, most deaths are attributable to non-communicable diseases (32 million) and just over half of these (16.7 million) are as result of Cardio Vascular Disease (CVD). More than one third of these deaths occur in middle-aged adults. In developed countries, heart disease and stroke are the first and second leading cause of deaths for adults' men and women. As these facts are familiar and hardly surprising in some of the developing countries, CVD have also become the first and second leading causes responsible for one-third of all deaths. Cardiovascular disease is responsible for about 25 percent of the daily loss due to non-communicable disease in SEAR countries. In these, IHD accounts for about 19 percent, Rheumatic heart disease about 6 percent and other conditions about 29 percent [1].

A few Bibliometric studies have been reported in the literature on Cardiology. This research analysed Cardiology publications output for 1964-2006 and its impact using citations for different countries. The results of this study focus on G8 countries (USA, UK, Japan, France, Italy, Germany, Canada and Russia). Cronin & Licea De Arenas [2] studied the distribution of Mexican health science publications accordingly to the states of origin institutions and main cities using BIOSIS, EMBASE, CAB and MEDLINE. Database results showed that Mexican health science research activities were highly skewed.

Licea De Arenas [3] studied the contribution of higher educational institutions to the development of Mexican Health Science using different database for the period 1982-1986 and found the public sector was the major provider of scholarly research output about 70% of the articles appeared in foreign journals.

2. OBJECTIVES

The objectives of the present study are to quantitatively document the Publication Productivity Behaviour of Cardiology

1 To find impact factor of the journals in G8 countries
2 To study the distribution of papers according to average impact factor of journals
3 To identify the leading institutions contributing journal papers among G8 Countries
4 To study the pattern of domestic and international collaboration of G8 countries

3. METHODOLOGY

A total record of 17197 Cardiology publications published in the MEDLINE Database (National Library of Medicine) during 1964-2006 as per the bibliography compiled by MEDLINE CD Version were taken and all the bibliographic details of publication in softcopy were analysed by the SPSS (Statistical Package for Social Science) for the purpose of this study.

4. ANALYSIS AND DISCUSSION

The analysis of the data indicates that MEDLINE CD version (MEDLARS) abstracted 13028 publications of these journals and the productivity was 9726 during 1964 and 2006. Table 1 shows that the impact factor of co-author papers varied between 0 and 6.5. The average impact factor of all co-author papers was 0.86. The distribution of journal output and impact factor has been analysed by the Web of Science, the highest no. of publications was the American Journal of Cardiology (8%). The journals highest impact factor was produced by Chest Journal (6.5). Twentieth Century has seen tremendous collaborative research trend among scientists working group within and across the geographic boundaries of a country which enhanced the ability of scientists to put in their intellect collectively and make significant progress in their respective domains specialisation. Collaboration is inevitable in natural sciences and multidisciplinary areas to make significant advances and breakthrough.

Table 1 Impact Factor of the Journals in G8 Countries

S. No	Title of the Journal	Frequency	Percent	Impact Factor
1	Journal of the American College of Cardiology	784	8.0	0.07
2	Circulation	634	6.5	0.15
3	American Journal of Cardiology	623	6.4	0.05
4	Heart (British Cardiac Society)	541	5.5	4.90
5	Clinical Cardiology	408	4.1	2.13
6	Canadian Journal of Cardiology	297	3.0	0.08
7	American Heart Journal	280	2.8	0.16
8	British Heart Journal	262	2.6	0.16
9	Journal of Nuclear Cardiology	260	2.6	0.02
10	Journal of Cardio Vascular Management	228	2.3	0.13
11	The Journal of American Medical Association	213	2.1	0.27
12	International Journal of Cardiology	209	2.1	0.05
13	Nursing Standard	180	1.8	1.83
14	Current opinion in Cardiology	176	1.8	0.02
15	Chest	167	1.7	6.50
16	Cardiology in the Young	165	1.6	0.79
17	PACE	157	1.6	2.18
18	Pediatric Cardiology	152	1.5	0.89
19	Cardiovascular Research	150	1.5	1.54
20	Journal of Interventional Cardiology	148	1.5	1.99
21	Journal of Invasive Cardiology	146	1.5	1.35
22	Annals of Internal Medicine	145	1.4	1.16
23	Archives of Internal Medicine	139	1.4	0.04
24	New England Journal of Medicine	138	1.4	0.25

S. No	Title of the Journal	Frequency	Percent	Impact Factor
25	Catherization and Cardiovascular Intervention	138	1.4	1.31
26	American Journal of Medicine	132	1.3	1.13
27	Annals of Thoracic Surgery	132	1.3	0.04
28	Modern Healthcare	131	1.3	0.35
29	Italian Heart Journal	131	1.3	0.04
30	Cardiology	130	1.2	3.13
31	Catherization and Cardiovascular Diagnosis	126	1.2	0.14
32	Coronary Artery Disease	126	1.2	1.03
33	Journal of Molecular and Cellular Cardiology	124	1.2	0.26
34	Hypertension	121	1.2	2.00
35	Pediatrics	120	1.2	1.12
36	CMAJ	120	1.2	0.03
37	Cardiology Clinics	119	1.2	0.03
38	Journal of Electro cardiology	117	1.2	0.04
39	Annals of Emergency Medicine	117	1.2	0.04
40	American Journal of Physiology	117	1.2	0.06
41	Journal of Nuclear Medicine	116	1.1	0.06
42	Resuscitation	116	1.1	2.32
43	Journal of American Society of Echo Cardiograpy	115	1.1	0.04
44	Circulation Research	115	1.1	0.58
45	Journal of Telemedicine and Tele care	112	1.1	0.02
46	Medical Times	112	1.1	1.24
47	Journal of Cardiology	112	1.1	0.45
48	Journal of General Internal Medicine	109	1.1	0.07
49	Studies in Health Technology and Informatics	108	1.1	0.64
50	Heart & Lung-The Journal of Critical Care	108	1.1	0.03
	Total	**9726**	**100**	

Table 2 Distribution of Papers According to Average Impact Factor of the Journals

Average impact factor	Number of papers (%)	Cumulative percent
>0.00 ≤ 2.00	8207(84.3)	84.3
>2.00 4.00	811(8.3)	92.7
>4.00 6.00	541(5.5)	98.2
>6.5	67(1.7)	100

Table 2 indicates that 75% of papers have appeared in journals with average impact factor d 3. The proportion of papers with average impact factor > 2d ” 4 and >4d 6 is almost equal. The countries which published these papers in journals average impact factor 6.5 were examined. It is found that the 167 papers were published in journals with impact factor > 6.5. USA has contributed 6970, UK 2921, Japan 223, Italy 766, Germany 846, France 842, Canada 337 and Russia 123. The rest 4169 papers have published from 68 countries. The USA and the UK have published more papers in high average impact factor journals than other countries.

Table 3 Leading Institutions Contributing Journal Papers Among G8 Countries

S. No.	Country	Institutions	No. of Publications	Cumulated no. of Publications	Rank
1	USA	Massachusetts Medical school, Worcester	220	220	1
2	UK	University College London, Grafton ag.	196	416	2
3	Germany	Justus-Liebeg University of Giessen.	167	583	3
4	Italy	Institute of Clinical Physiology, Pisa.	138	721	4
5	France	University Hospital of Anger.	124	845	5
6	Canada	University of Torondo	112	957	6
7	Japan	Jubetendo University School of Medicine, Tokyo.	72	1029	7
8	Russia	Russian Academy of Medical Sciences, Moscow.	56	1085	8

From table 3, it is found that 1085 papers were widely distributed over 96 institutions. It could be seen that almost 50% of the papers were produced by 8 institutions. Massachusetts Medical School, Worcester had submitted the highest number of papers followed by University College London, Crafton ag. Russian Academy of Medical Sciences, Moscow produced least number of publications. The Massachusetts Medical School, Worcester, USA published 2.2% higher than University College London Grafton ag, UK and Justus –Liebeg University of Giessen, Germany published 2.3% higher than Institute of Clinical Physiology Pisa, Italy. University of Torondo, Canada published 1.1% lesser than University Hospital of Anger, France and Russia Academy of Medical Science, Moscow. Russian Academy of Medical Sciences, Moscow published 1.9% lesser than Jubetendo University school of Medicine, Tokyo, Japan.

Table 4 Pattern of Domestic and International Collaboration of G8 Countries

Countries	Pattern of Domestic Collaboration (DCI)	Pattern of International Collaboration(ICI)	Total Papers (DCI+ICI)
USA	4520 (0.9)	2450(1.0)	6970
UK	1832 (0.9)	1089(1.1)	2921
JAPAN	184 (1.2)	39(0.5)	223
ITALY	542 (1.0)	224(0.8)	766
GERMANY	634 (1.1)	212(0.7)	846
FRANCE	624 (1.1)	218(0.7)	842
CANADA	297(1.1)	40(0.3)	337
RUSSIA	95 (1.1)	28(0.6)	123
Total	878	4300	13028

5. PATTERN OF COLLABORATION

It is also examined by the pattern of domestic as well as international collaboration.The indicators used to measure domestic and international collaboration are Domestic Collaborative Index (DCI) and International Collaborative Index (ICI) suggested by Garg [4].

6. CONCLUSION

This study dealt with the nature of Cardiology journals' papers published in G8 countries. The journal productivity on Cardiology in which the Journal of American College of Cardiology (8%) was followed by Circulation (6.5%). The Journal productivity on Studies in Health Technology and Informatics and Heart & Lung-The journal of Critical Care are contributed equally (1.1%) among G8 countries. The average impact factor of cardiology journals between 0.00 2.00 and 0.02 4.00 is 76%. The cardiology journals productivity among leading institutions value is 17% between Massachusetts Medical School and Russian academy of Medical Science. According to pattern of Domestic and International Collaboration among G8 countries, the USA contributed high and was followed by UK. The contribution for Cardiology Journals was very less from Russia among G8 countries.

REFERENCES

[1] WHO, Tech., Rep. Norway, ser. no 678, 1982.

[2] J. Cronin, B. Licea and De Arenas, "The Geographic Distribution of Mexican Health Science Research", Scientometrics, Vol.17 No.3, 1989, pp. 39-48.

[3] J. Licea and De Arenas, "Partial Assessment of Mexican Health Science Research 1982 -1986", Scientometrics, Vol.23 No.4, 1992, pp. 47-55.

[4] K.C. Garg, "An overview of Cross-National, National and Institutional Assessment as Reflected in The International Journal Scientometrics", Scientometrics, Vol.56 No.2, 2003. pp. 169-199.

SEARCHING OF INFORMATION FROM THE INTERNET: A STUDY AMONG ENGINEERING STUDENTS IN CUDDALORE DISTRICT, TAMIL NADU

S.Dhanavandan[1], Dr. S. Mohamed Esmail[2] and S.Sivaraj[3]
[1]Ph.D Scholar & Librarian (S.G.), Krishnasamy College of Engineering and Technology, Tamil Nadu
[2]Reader, Dept. of Library and Information Science, Annamalai University, Tamil Nadu
[3]Head, Learning Resource Centre, Bannari Amman Institute of Technology, Tamil Nadu
E-mail: kdhana_kcet@yahoo.com
(Received on 23 July 2007 and accepted on 14 August 2007)

Abstract

This study attempts to examine the characteristics and internet using behaviour of the respondents studying in the engineering colleges at Cuddalore district, Tamil Nadu. In order to study the characteristics and internet usage by the respondents, three colleges in Cuddalore district were chosen for this study. The following methods were used to collect the data for the investigation. (A) Questionnaire method,(B) Semi structured interviews with the librarian,(C)Observational visit to the library. The data collected were analysed and inferences made based on standard statistical methods. Eleven percent of the respondents expressed that they didn't know how to use the internet. It is suggested that the library professionals should concentrate on providing library orientation programme for all the students studying in their institutions to motivate them and make them familiar with e-resources.

Index Terms: *User study, Search of internet, E-resources*

1. INTRODUCTION

The internet and its World Wide Web (WWW) have given a paradigm shift towards the information management. The Information available over the net is increasing rapidly and the task of providing relevant information to patrons is gaining paramount importance in all types of libraries. Most of the reputed publishers, learned and commercial societies are hosting their products on the net and also all libraries are sharing their internal and external information resources by means of web pages and Web-OPACs. The powerful search engines over net are aiding the information location quite efficiently. The internet services like E-mail, Bulletin boards, Newsgroups, Discussion lists, etc., are gaining importance in libraries and become indispensable resources for the users. Due to the impact of internet, there is a swift migration from offline to online, as web becomes a popular user interface for providing access to remote and frequently updated resources.

2. LITERATURE REVIEW

Bavakutty and Salih [1] conducted a study at Calicut University, which showed the purposes of internet use were: sending and receiving e-mails in connection with academic requirements, making a search on library catalogues, downloading images and communication with the peer. Hanauer et al., [2] surveyed that they had free internet access through their community college, yet only 97% of the students reported having access to the internet. The survey showed that 83% of internet users had access to the internet at their homes and 51% of the respondents accessed internet at colleges. Asemi [3] revealed that the researchers of the university got quality information through the internet. Fifty five percent of the respondents searched for scientific information through the internet as the university library had provided access to various databases and online journals for all the students and staff. Amritpal Karu [4] conducted a study indicated that all respondents used internet for sending e-mail and 82% for Web. More than 60% of the respondents used internet for primary information. 38% for secondary and only 15% used it for consulting OPACs. Mishra, Yadav and Bisht [5] conducted a study to know Internet utilization pattern of the undergraduate students of G B Pant University of Agriculture and Technology, Pantnagar. The findings of the study indicated that a majority of the students (85.7%) used the internet. Out of the internet users 67.7% were male and 32.3% female students. The findings of the study

also showed that 61.5% of the males and 51.6% of the females used internet for preparing assignments.

3. OBJECTIVES

1 To know the characteristics of study population
2 To study the length and frequency of using internet by the respondents
3 To analyse the purpose and its frequency of internet used by the respondents
4 To study the frequency of use of internet resources and tools by the respondents
5 To know how the internet based resources are identified by the respondents
6 To rank the features of internet resources by the respondents
7 To study the use of search engines and websites by the respondent
8 To know the reason for not using the internet service

4. METHODOLOGY

This study attempts to examine the characteristics and internet using behaviour of the respondents studying in the engineering colleges at Cuddalore district, Tamil Nadu. In order to study the characteristics and internet usage by the respondents, the researcher has chosen three colleges in Cuddalore district. Such as 1.Krishnasamy College of Engineering and Technology, 2.Dr. Navalar Nedunchezhiyan College of Engineering and 3. Sri Jayaram Engineering College .The well – tested questionnaire was distributed personally to the student community of engineering colleges located in Cuddalore district. Two hundred questionnaires were distributed to the respondents, out of this 195 were received back, making the response rate of 97.5%. The collected data were classified and tabulated according to the objectives of the study, and analysed by using statistical tools, such as percentage analysis and ranking analysis.

4.1 Characteristics of Study Population

Table 1 Characteristics of Study Population

Characteristics	Number	Percentage
Semester		
I Semester	48	24.61
III Semester	45	23.08
V Semester	52	26.67
VII Semester	50	25.64
Branch		
Mechanical Engg.	30	15.38
Computer Science Engg.	42	21.54
Electronics and Communication Engg.	40	20.51
Electrical and Electronics Engg.	45	23.08
Information Technology	38	19.49
Sex		
Male	128	65.64
Female	67	34.36
Study		
Hostel	37	18.97
Rented Room	25	12.82
House	133	68.21
Domicile		
Rural	75	38.46
Urban	120	61.54
Category		
OC	62	31.79
BC	92	47.18
SC/ST	41	21.03
Knowledge of computer		
Yes	190	97.44
No	5	2.56

Table 1 shows the study population comprised of male and female undergraduate students of I, III, V, and VII semesters belonging to five branches, viz. Mechanical Engineering, Computer Science, Electronics and Communication Engineering, Electrical and Electronics Engg.,and Information Technology. Among the study population (N=195) 15.38 per cent of the respondents belongs to Mechanical engineering, 21.54 per cent in Computer science, 20.51 percent belong to Electronics and Communication, 23.08 percent in Electrical and Electronics and 19.49 percent in Information Technology. Regarding sex categories, 65.64 per cent of the respondents are male and rest of 34.36 per cent female.

About 18.97 per cent of the respondents studying in hostel, 12.82 per cent of the respondents studying in rented rooms and the majority of (68.21 per cent) respondents coming from home to college are dayscholars. In the study population, majority of the respondents (61.54%) to urban area and 38.46% of the respondents belong to rural area. In the categories of social class, most of the respondents (47.18%) are Backward Class, 31.79 per cent are Other Class and 21.03 per cent of respondents are from Scheduled Caste / Schedule Tribes category.

4.2 Use of the Internet

Table 2 Use of Internet

Response	Number	Percentage
Use		
Yes	155	79.49
No	40	20.51
Length of use		
Less than 6 months	80	41.03
6 – 12 months	65	33.33
12 – 24 months	38	19.49
More than 24 months	12	6.15
Place for accessing internet		
Home	27	13.85
College	39	20
Cyber café	68	34.87
Home and college	12	6.15
Home and cyber café	18	9.23
College and cyber café	31	15.9
Frequency of using internet		
Daily	65	33.33
Two times a week	32	16.41
One time a week	15	7.7
Once in two week	14	7.18
Once in a month	12	6.15
As and when required	57	29.23

The study revealed that nearly 80 per cent of the respondents were using the internet. Among the respondents (N=195), 41.03 per cent of them were using it for six months, 33.33 per cent of them 6 to 12 months, 19.49 per cent of them 12-24 months and only 6.15 per cent of them for more than 24 months.

Place for accessing internet revealed that more number of respondents (34.87%) were accessing internet in cyber café and 20 per cent of the respondents were in college. Regarding frequency of using internet shows that 33.33 per cent of the respondents used internet daily and 29.23 per cent of them used internet as and when required.

4.3 Frequency of Using Internet

Table 3 shows the frequency of using internet for various purposes by the respondents. Among the purposes study about internet is 1.93 range and comes first in position and it is followed by for sending and receiving e-mail, read newspaper, visit websites, chatting with 2, 3, 4 and 5th in position respectively. It could be seen from the above discussion that more number of respondents frequently used the internet for the purpose of 'know more about internet', and only limited respondents less frequently used the internet for the purpose of access to e-journals and e-documents.

Table 3 Frequency of Using Internet for Various Purposes

Purpose	Very frequent	Frequently	Occasionally	Rarely	Never	Mean
Look for course related materials	05 (3.22)	10 (6.45)	03 (1.94)	7 (4.52)	130 (83.87)	0.31 (10)
Visit websites	25 (16.13)	22 (14.19)	23 (14.84)	22 (14.19)	63 (40.65)	1.40 (4)
Searching subject databases	8 (5.16)	6 (3.87)	-	8 (5.16)	133 (85.81)	0.17 (12)
Searching catalogs of libraries	5 (3.22)	3 (1.94)	4 (2.58)	-	143 (92.26)	0.09 (14)
Access to e-documents	4 (2.58)	3 (1.94)	3 (1.94)	1 (0.65)	144 (92.90)	0.08 (15)
Access to e-journals	3 (1.94)	3 (1.94)	2 (1.29)	3 (1.94)	144 (92.90)	0.08 (15)

For sending and receiving e-mail	22 (14.19)	38 (24.52)	35 (19.35)	47 (30.32)	13 (8.39)	1.79 (2)
Employment, fun, play games	12 (7.74)	28 (18.06)	30 (19.35)	5 (3.22)	80 (51.61)	1.00 (6)
Career information	8 (5.16)	15 (9.68)	18 (11.61)	2 (1.29)	112 (72.26)	0.59 (7)
Teleconferencing	2 (1.29)	3 (1.94)	-	3 (1.94)	147 (94.84)	0.10 (13)
On line learning	3 (1.94)	2 (1.29)	4 (2.58)	-	146 (94.19)	0.10 (13)
Downloading programmes	5 (3.22)	7 (4.52)	5 (3.22)	5 (3.22)	133 (85.81)	0.24 (11)
View movies	6 (3.87)	10 (6.45)	15 (9.68)	1 (0.65)	123 (79.35)	0.40 (8)
Listening to music	4 (2.58)	11 (7.0)	10 (6.45)	5 (3.22)	120 (77.42)	0.32 (9)
Look for advertisements	4 (2.58)	10 (6.45)	8 (5.16)	11 (7.10)	122 (78.71)	0.32 (9)
Read newspaper	34 (21.94)	22 (14.19)	6 (3.87)	6 (3.87)	87 (56.13)	1.60 (3)
Know more about internet	16 (10.32)	26 (16.71)	28 (18.06)	32 (20.65)	53 (34.13)	1.93 (1)
Chatting	7 (4.52)	22 (14.19)	25 (16.13)	31 (20.00)	70 (45.16)	1.19 (5)

4.4 Frequency of Using Internet Resources and Tools

Table 4 shows the frequency of using the various internet resources. Three-fourth of the students were using the internet tools like Word Wide Web, Internet search engine, E-mail and Mailing lists. Its resources and services like FAQ, finger, veronica, WAIS, gopher, Archie, FTP, use net/ newsgroup, mailing lists and telnet were never used at all by a majority. The mean of the use of its resources and tools ranged between 3.15 and 0.48 indicating the frequency of use. It could be seen from the above discussion that www occupies the first position with 3.15 mean value and Veronica, WAIS, FAQ occupied the last position with 0.48 mean values.

Table 4 Frequency of Using Internet for Resources and Tools

Internet resources and tools	Very frequent	Frequently	Occasionally	Rarely	Never	Mean
E-mail	22 (14.19)	38 (24.52)	35 (22.58)	47 (30.32)	13 (8.39)	1.78 (3)
Mailing lists	15 (9.68)	25 (16.13)	31 (20)	11 (7.10)	73 (47.10)	1.33 (4)
Use net/ news group	10 (6.45)	16 (10.32)	27 (17.42)	10 (6.45)	92 (59.35)	0.9 (6)
FTP	10 (6.45)	12 (7.74)	13 (8.39)	12 (7.74)	108 (69.68)	0.68 (7)
Gopher	8 (5.16)	11 (7.10)	11 (7.10)	9 (5.81)	116(74.84)	0.55 (8)
Archie	8 (5.18)	9 (5.81)	11 (7.10)	11 (7.10)	116(74.84)	0.51 (9)
WAIS	7 (4.52)	9 (5.81)	10 (6.45)	11 (7.10)	118(76.13)	0.48 (11)
Veronica	7 (4.52)	9 (5.81)	10 (6.45)	11 (7.10)	118(76.13)	0.48 (11)
Finger	7 (4.52)	9 (5.81)	11 97.10)	10 (6.45)	118(76.13)	0.49 (10)
Telnet	9 (5.81)	20 (12.90)	30 (19.35)	6 (3.89)	6 (3.87)	1.01 (5)

World wide web	63 (40.65)	50 (32.26)	30 (19.35)	6 (3.89)	6 (3.87)	3.15 (1)
FAQ	8 (5.16)	9 (5.81)	8 (5.16)	11 (7.10)	119	0.48 (11)
Internet search engineer	40 (25.81)	45 (29.03)	32 (20.64)	18 (11.61)	20 (12.90)	2.9 (2)

4.5 Identification of the Internet Based Resources

Figure 1 shows that the identification of the internet based resources by the respondents through various methods. Personal communication was the first preferred source for identifying internet based resource and it was followed by attending training programs, use of internet search engine, browse the sites regularly, follow up references in print sources, subscribe to mail lists, and system managers staff of internet services.

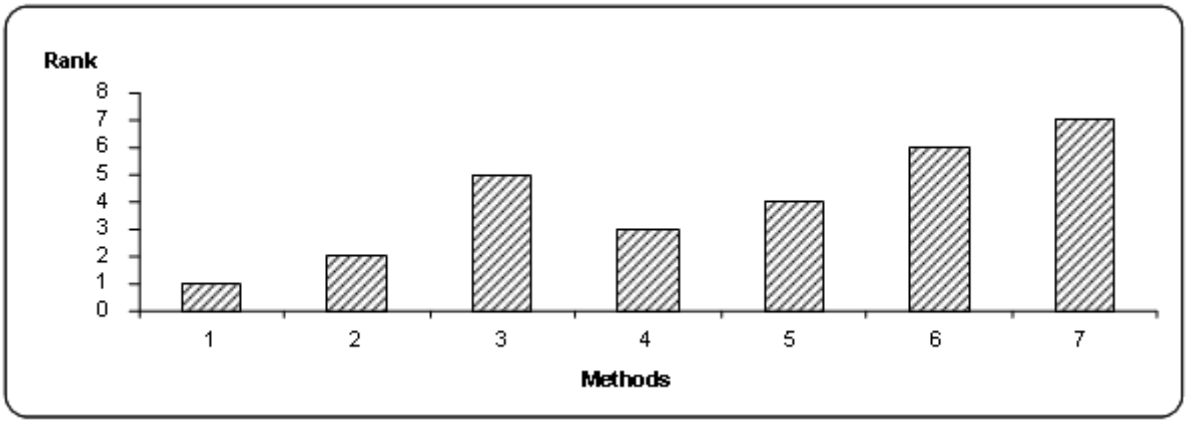


Fig.1 Identification of the Internet Based Resources

4.6 Rating of Internet Resources

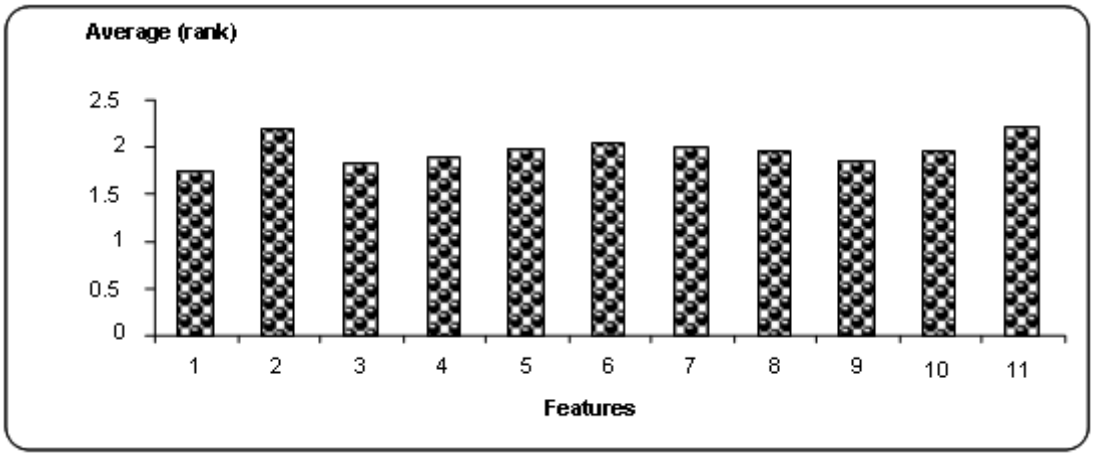


Fig.2 Rating of Internet Resources

Figure 2 shows the rating of internet resources by the respondents of a particular college. The mean values of rating internet resources were between 2.22 and 1.76, which imply that its resources were rated either very good or good for various features. Usefulness, accuracy, and ease to use are the three features that come first ranks and other features flexibility, permanence, consistency, availability, filminess authority accessibility followed the order as 4, 5, 6, 7, 8, 9, and 10 respectively.

4.7 Level of Satisfaction With Regard to Use of Internet in the College

Sixty four percent of the respondents highly satisfied with the sevice offered by staff in charge, 41.02 percent

with the time allotment and remaining 20.51 percent with printing as downloading facilities. Like wise 48.72 percent of the respondents satisfied with multimedia facilities, 46.51 percent with time allotment and 38.46 percent with printing and downloading and reservation facilities in the college. It is also evident from the table that most of the respondents are dissatisfied with number of notes available in college.

4.8 Use of Search Engines

Table 5 shows the use of search engine by the respondents. Majority (27 percent) of the respondents using Google Search, 23 percent, 17 percent, 14 percent of the respondents were using the internet through Yahoo, Hotmail and Rediff search engines respectively. Further, 19 percent of the respondents were using the internet through other search engines.

Table 5 Use of Search Engines

Search engines	Number	Percentage
Yahoo	45	23
Google	51	27
Hotmail	34	17
Rediff	28	14
Others	37	19

4.9 Internet Facilities and Services to be offered by Library

Table 6 Internet Facilities and Services to be offered by Library

Services to be offered by the colleges	Number	Percentage
Course related materials	140	71.79
Discipline oriented websites	122	62.56
Searching subject databases	103	52.82
Searching on line public access catalyses	75	38.46
Accessing e-documents	82	42.05
Accessing e-journals	78	40
Sending and receiving of e-mail	92	47.18
Career information	109	55.9
Conferencing	62	31.79
On line learning	85	43.59
Downloading progress files images	93	47.69
Newspapers	105	53.85
Electronic document delivery	111	56.92

Table 6 shows the internet facilities and services to be offered by the libraries. Among the respondents 195, 71.79 percent of them felt that the library should offer course related materials, 62.56 percent of them required discipline oriented websites, 56.92 percent of them requested electronic document delivery services, 55.90 percent required career information, 53.85 percent required newspapers service, 52.82 percent required searching subject databases 47.69 percent required downloading progress files and image, 47.18 percent required sending and receiving of e-mails 43.59 per cent required online learning 42.05 accessing e-documents, 40 percent required acquire of e-journals and 31.79 percent needs conference information services.

4.10 Reasons for not Using Internet

Table 7 Reasons for not using internet

Reasons	Number	Percentage
Don't felt it is necessary	12	6
Don't know, how to use	21	11
Lack of facility	94	48
Lack of awareness	12	6
Lack of time	35	18
Not getting what is needed	13	7
Fear anxiety	8	4

Table 7 shows the reasons for not using internet and its services. Out of 195 respondents, 6 percent of them have expressed that the internet is not necessary. Majority of the respondents (48 percent) reported that the internet facility available in their colleges is not sufficient. Eleven percent of the respondents express that they don't know how to use it.

5. CONCLUSION

This study attempted to examine the characteristics and internet using behaviour of the respondents studying in the engineering colleges at Cuddalore District, Tamil Nadu. From this study, regarding sex category 65.64 per cent of the respondent are male and rest of 34.36 per cent are female. About 18.97 per cent of the respondents studying in hostel, 12.82 per cent of the respondents studying in rented rooms and the majority of (68.21 per cent) respondents coming from home to college are dayscholars.

The finding of frequency of using internet resources and tools shows that World Wide Web (WWW) the most used internet tool by the respondents. 90 per cent of the respondents using general websites and using the yahoo search engine. The slow accessibility searching, browsing, downloading are the major difficulties faced by the respondents. The students demanded course materials, website information and electronic document delivery services from the library. Since the library professionals have not given any orientation programme to the freshers, eleven percent of the respondents have expressed that they don't know how to use the internet. It is clear that the library professionals should concentrate on providing library orientation programme for all the students studying in their institutions to motivate them to be familiar with e-resources.

REFERENCES

[1] M.Bavakutty and Muhamad Salih, "Internet Services in Calicut University", National Convention Academic Libraries in the Internet Era, INFLIBNET, Ahemdabad, 18-20 February 1999, pp.37-44.

[2] D. Hanauer, E.Dibble, J.Fortin, and N.F.Col, "Internet Use among Community College Students: Implications in Designing Healthcare Interventions", Journal of American College Healt, Vol.52 No.5, 2004, 197-202.

[3] A.Asemi, "Information Searching Habits of Internet Users: A Case Study on the Medical Sciences University of Isfahan, Iran", Webology, Vol.2 No.1, 2005.

[4] A.Kaur, "Internet Facility at GNDU: A Survey. National Seminar on Academic Libraries in the Modern Era", IASLIC, Bhopal, 4-6 December 2000, pp. 119-124.

[5] O.P.Mishra, N.Yadava, and K. Bisht, "Internet Utilization Pattern of Undergraduate Students", University News, Vol.43 No.13, 2005, pp.8-12.

WEB-BASED INFORMATION SERVICES IN SOFTWARE INDUSTRY LIBRARIES: A CASE STUDY

Parashuram S. Kattimani[1] and Dr. V.T. Kamble[2]
[1]Assistant Librarian, Gulbarga University, Karnataka
[2]Reader, Department of Library and Information Science, Gulbarga University, Karnataka
E-mail: parashu_kattimani@rediffmail.com
(Received on 25 July 2007 and accepted on 16 August 2007)

Abstract

The major development and Web based information services seen in the software industry libraries use various kinds of information services, which have been produced with the help of computers and IT tools. The commonly used motivating web based information services are Web OPAC services, Internet and Intranet Information Services, Information Services offered in the firm Manual and Automation. Hence difficulty is faced by the IT industry librarians. This paper studied the web based services provided to the users.

Index Terms: *Web based services, Information technology, IT industry libraries, Web OPAC, Internet,Intranet*

1. INTRODUCTION

The revolution of digital library is a landmark in the LIS profession of 21st century which promises delivery of complete information to user's desktop in a seamless manner from any corner of the Globe. The present century is the century of information society and various technological developments in IT sector, credit for India's rapid growth in the IT sector going to the availability of a robust infrastructure telecom, power and roads in the country. Relevant telecom facilities are an important prerequisite for the success of the software industry and over the years, the Government has taken steps to ensure that telecom remains priority. The communication technologies including this various applications in the telecommunication such as radio, television, cable, satellites, internet etc are driving the social shift towards the information society. These technologies converge today in order to form new ones and make their separate identity difficult. Computer has affected them the most with its application in almost all the areas of information collection, storage and dissemination [1].

IT industry, Information Technology and in particular the Software Industry are the fastest growing sectors of the Indian economy with more than 2000 companies. It is host to established IT companies such as IBM, Intel, Microsoft, Oracle, Cisco, Sun, HP and also to many innovative companies with leading edge capabilities in their respective fields like Juniper, Dell, Compaq, Cerent Tellabs [2]. It has its own homegrown leaders in Indian IT industries i.e. Infosys, Wipro, Satyam, TCS, I-Flex Solutions Ltd, Tata Infotech Ltd, CMC Ltd, Mphasis BFL Ltd, Mastek Ltd. and NIIT [3].

2. OBJECTIVES

1 To know the top ten IT companies in India
2 To know the motivating services
3 To know the Web OPAC services
4 To know the Web-based information services rendering to the software engineers
5 To know the difficulties involved in rendering the ICT services to the users
6 Suggest the measures to improve the ICT services to the users of Software Industry

3. METHODOLOGY

The study population emphases of IT companies in India, wherein investigator tried to excel in-depth about the web based Information services are rendered by the libraries of these software industry libraries. In India, there are numerous IT companies in various disciplines. The investigator has studied top ten software industries in India based on the magazines reports like Business Today, Business India, Dataquest and Internet source. Based on the top ten IT industries for 2005-06 [4], the questionnaire was distributed to all ten software industries, the investigator succeeded in obtaining all ten questionnaire

from the different software industry in India i.e. Infosys, Wipro, Satyam, TCS, I-Flex Solutions Ltd, Tata Infotech Ltd, CMC Ltd, Mphasis BFL Ltd, Mastek Ltd. and NIIT.

4. SCOPE AND LIMITATION OF THE STUDY

The research study is confined to library services of Indian top ten multinational companies. Owing to large number of IT industries in the country, the investigator has restricted his scope to only top ten software industries in India, as Karnataka has the fastest growing silicon city in Asia [5]. The most of these IT industries are of confidential in nature. The investigator could not adopt observation technique to understand the Web based information services offered in IT company libraries. It is the limitation of this study.

5. DATA ANALYSIS AND INTERPRETATION

The study compares the various software industries and their establishments in India. Further, the establishment of software companies and their library services are differ from one IT company to another in the interest of the national out put and purpose.

Table 1 Motivating Web Based Information Services

Web based services	Opinion		
	1	2	3
Internet is an indispensable tool for accessing the information	-	8	2
Information Technology improves efficiency of Library services	-	6	1
Users demand for Internet information	-	3	6
Information technology has become an integral part of library services	1	2	6
Most of the libraries are adopting information technology	1	5	3
Information Technology supports the activities and services as an supplement and not substitute	-	4	3

1-strongly disagree 2-Agree 3-Strongly Agree

It is observed from the table that, most of the IT libraries surveyed for the motivating factors that have enabled them to extend web based information services.It is found that information technology is an indispensable tool for accessing wealth for information (80%). Further the librarians have strongly agreed to the fact that Information Technology has become integral part of library services (60%) and users demand for Internet information services (60%). Most of the libraries are adopting Information Technology (30%) and Information Technology supports the activities and services as a supplement and not substitute (30%).

Thus from the above it is found that the over all reasons for extending and motivating web based library services to the users community are due to the fact that IT has become integral part of libraries to support for in-house activities as well as to offer information services to the users, as they demand for web based information services [6].

Table 2 Web-OPAC Services

Sl No	Web-OPAC services	If Yes			If No, reasons are			
		1	2	3	A	B	C	D
1	Access to Library Web-OPAC	1	2	7	-	-	-	-
2	Content Page Services	2	3	5	-	-	-	-
3	Recent addition of the Books/Journals	1	1	7	1	-	-	-
4	Electronic communication to users	-	1	9	-	-	-	-
5	Display of notices/circulars	-	2	-	4	-	4	-
6	Status of checking Books/Journals lend out or on shelf.	-	1	6	-	-	1	1

N=10

1-To a little extent; 2-To some extent; 3-To full extent
A-Not necessary; B-Users not interested; C-Facility not available; D-Lack of support from staff

Library OPAC refers to Online Public Access Catalogue is a retrieval tool for the user community activates as a desktop display reflecting the mirror of treasure of knowledge. It helps in knowing the status of availability of documents in the library providing variety of search points by author, title, subject, keywords, type of materials, etc.

It is found from the above table that 70% of the libraries provide access to library Web-OPAC to full extent. 20% of libraries provide to some extent and little extent respectively. 50% of the libraries render content page services. Each 40% result has been yielded that necessary facility is not available in their libraries.

Table 3 Internet and Intranet Information Services

Internet Information Services	If Yes			If No, reasons are				Total
	1	2	3	A	B	C	D	
Good morning headlines	1	1	4	1	-	1	1	9
News letter services	1	-	6	-	1	-	-	8
Forth coming event	-	1	4	1	-	1	1	8
New arrivals	-	-	7	-	-	1	1	9
Content page services	-	1	6	-	1	-	-	8
File transfer protocol (FTP)	-	1	8	-	-	-	-	9
Video conferencing	-	1	9	-	-	-	-	10
Access to online e-journals	-	-	6	-	-	-	1	7
Access to online e-books	-	-	8	-	-	1	-	9

1-To a little extent; 2-To some extent 3-To full extent
A-Not necessary; B-Users not interested; C-Facility not available; D-Lack of support from staff

The table 3 reveals that Good Morning headlines is a valuable resource available on the internet. The information updates about the IT industry and it briefs about the stock exchange NSC, BSC, etc. Users of IT industries are making use of this information and updating their knowledge. Every day morning, these head lines would be sent to the users via e-mail about 40% of the IT companies using this facility regularly. 60% of News letter services, 40% Forthcoming event, 70% of New arrivals, 60% of Content page services, 80% of File transfer

protocol (FTP) are used for retrieving software or data from a remote site for downloading to the computer. It has been made it possible to setup public accessible archives on internet with all kinds of documents. 90% of Video conferencing is an online platform of discussion among the peer groups which include textual, visual, audio and video form of telecast. 60% of Access to online e-Journals on the internet, large number of technical journals and various types of online are available and similarly 80% of IT libraries accessing to the online E-books for fulfilling their requirements and for speedy access.

Table 4 Information Services Offered: Manual Vs. Automated

Information Services	Use of Technology			
	Manual	Percentage	Automated	Percentage
Reference service	4	40	1	10%
Referral service	3	30	1	10%
Reprography service	1	10	5	50%
Document delivery service	-	-	7	70%
Fiscmirror CD-Rom server services	1	10	8	80%
Online Book procuring service	1	10	6	60%
SDI service	-	-	6	60%
Literature search service	-	-	3	30%
Translation service	-	-	5	50%

N=10

In libraries, reference service is a personalized service extended to the users based on the concept developed by Dr. S.R.Ranganathan. It may be either short term or long term reference service answered mainly to facts and figures. Reference service is dominated in traditional form (40%). It is found that referral is naturally a directed service, manual mode accounting to 30% while the use of technology in offering referral service. Use of referal to reproduction (30%). Automation dominates in all the fields as comparing to manual; the reprographic service refers to reproduction (10%).

It is found that library automation is widely used in terms of rendering services, Reference services, Referral services, Reprography services, Document delivery services, Fiscmirror CD-Rom server services, Online Book procuring service, SDI service, Literature search service and Translation services. 80% of library services are automated with Fiscmirror CD-Rom server services and followed by Document delivery service (70%), and Online Book procuring services (60%).

Table 5 Difficulty in Rendering ICT Services to the Users

Problems of IT Services	No of Respondents	Percentage
Lack of sound information technology infrastructure	2	20
Lack of expertise in handling technology	1	10
Lack of co-ordination from the staff	-	-
Difficulty in maintaining the library homepage and regular updates	4	40
Any other (lack of staff)	3	30

It reveals from table 5 that the routine difficulties in rendering ICT services are difficulty in maintaining the library homepage (40%) and this is followed by lack of staff (30%) and others.

The Infrastructure of Information Technology in software libraries is the basic requirement for rendering ICT based services to the users. Maintaining and executing the services using Information Technology require team support in using this technology effectively. It should also be noted that technology is not an ultimate and there is a chance of down or failure in the system administration. Trouble shooting and other technical works are required for maintaining the networked system of the library in the proper form [7].

6. FINDINGS

1 It is observed from the table1 that Information Technology is an indispensable tool for accessing wealth for information (80%). Information Technology has become integral part of library services (60%), Since users demand for internet information services (60%), most of the libraries are adopting information technology (30%) and information technology supports the activities and services as a supplement and not substitute (30%).

2 It is found from the above table 2 that 70% of the libraries are providing access to library Web-OPAC to the full extent. 50% of the libraries rendering content page services. 70% of the libraries provide details of recent addition of the books/journals, 90% provide electronic communication to users and 60% of the libraries provide status of checking books/journals lend out or on shelf. Each 40% of result has been yielded that necessary facility is not available in their libraries.

3 It is found from the table 3 that every day morning is the head line sent to the users via e-mail. About 40% of the IT companies use this facility regularly. 60% of the libraries provide news letter services, 40% forth coming event, 70% new arrivals, 60% provide content page services, 80% file transfer protocol (FTP) used for retrieving software or data from a remote site for downloading purpose. 90% of libraries provide video conferencing, an online platform of discussion among the peer groups which includes textual, visual, audio and video form of telecast. 60% of libraries provide access to online e-journals on the internet, large number of technical journals and various types of online available and similarly 80% of the IT libraries accessing the online e-books for fulfilling their requirements and for speedy access.

4 It is found from the table 4 that reference service is dominated in traditional form (40%) and (80%) of the library services are automated with Fiscmirror CD-Rom server services and followed by Document delivery service (70%), Online Book procuring services (60%) respectively.

5 It reveals from table 5 that rendering ICT services is difficult and also for mainaining the library homepage (40%) and this is followed by lack of staff (30%).

7. CONCLUSION

Libraries of IT sector have become a powerful tool for promoting innovation and realizing and introducing the new services to the users on their every day's walks of life. It occupies outstanding position in the creation of the web based information services and with new innovation systems available on the internet. The present professional circles meet the challenges of knowledge and to build the knowledge management systems in software libraries to fullfill the thrust of the users.

REFERENCES

[1] Hsin-Pei.Liu and Mei-Hwa.Yang, "A Study Of Corporate Librarian Participating in Knowledge Management Team in Taiwan High-Tech Industry", Bulletin of the Library Association of China, Vol.71, Dec 2003, pp.79-91.

[2] Ali Amjad, "Information Technology and Libraries", Ess Ess Publications, New Delhi,2004, pp. 297-301.

[3] http://www.chillibreeze.com/articles/TheTopTenSoftwareCompaniesinIndia.asp.

[4] N.Oxbrow and A.Abell, "Is There Life After Knowledge Management?", Information Outlook, Vol.6 No.4, Apr 2002, pp.20-2, 25-6 & 29.

[5] http://www.members.nasscom.org/artdisplay.asp?Art_id=1472.

[6] I.Pena, "Knowledge Networks as Part of an Integrated Knowledge Management Approach", Journal of Knowledge Management, Vol.6 No.5, 2002, pp. 469-78.

[7] K.Laszlo and A.Laszlo, "Evolving Knowledge for Development: The Role Of Knowledge Management in a Changing World", Journal of Knowledge Management, Vol.6 No.4, 2002, pp.400-403.

EXPLORING THE AVAILABILITY AND EFFECTIVE UTILIZATION OF ELECTRONIC RESOURCES IN DENTAL SCIENCE LIBRARIES IN THE STATE OF KARNATAKA

Dr. M.Vijayakumar[1] and B.Manjunath[2]
[1]Central Library, Birla Institute of Technology, Mesra, Ranchi
[2]Central Library, Vydehi Institute of Medical Sciences and Research Centre, Bangalore, Karnataka
E-mail:manju_lis@yahoo.com
(Received on 26 July 2007 and accepted on 18 August 2007)

Abstract

This paper presents the research work on Analysis of Availability & Accessibility of Electronic Resources in Dental College Libraries of Karnataka. During the study, 31 dental college librarians were responded out of which, majority of the library possessd full text journals (64.5%), 32.3% libraries had access to MEDLINE database, 71% of the library possessed e-resources through CD and internet and even 77.4 % of the library accessed e-resources through consortium, The helpfulness of consortium in libraries are maintenance. All colleges provide good number of infrastructure facilities in terms of computers with internet connection, Twenty two [70.96%] libraries have network in their libraries and 8 [25.8%] libraries are mobilizing the fund through charging deposit fee. This study concludes that LIS professionals should be well aware of the electronic resources available and evaluate them before acquiring/subscribing them for their library users.

Index Terms: *Electronic resources, Dental college libraries*

1. INTRODUCTION

Electronic information sources are often faster than consulting print indices, especially when searching retrospectively, and they are more straightforward when wishing to use combinations of keywords. They open up the possibility of searching multiple files at one time, a feat accomplished more easily than when using printed equipment[1]. Even nowadays, printed resources lose their values. So there is an urgent need to develop information resources in electronic or digital form. Even in libraries, the information resources like databases, journals, books, patents, dictionaries, standards, encyclopedia, treasures and others are available in the electronic form [2].

So even searching of needful information is challenging in the digital world. As we know today, despite of having well-stocked libraries and well-equipped resource centers, user's demand for information is never met. In this view, an attempt has been made to explore the availability of e-resources in dental college libraries.

2. REVIEW OF LITERATURE

Review of literature has been done by consulting various information sources like Library and Information Science Abstract [LISA], books, journal papers, conference / seminar papers and other resources [3]. The review shows a few similar studies in India [4, 5, 6 & 7]. In Karnataka, there is not such study made. Hence, an attempt to study the exploring e-resources for dental college libraries has been taken for this research problem.

3. STATEMENT OF THE PROBLEM

Keeping in view of availability and accessibility of e-resources to fulfill the needs of the health science library user community, this topic is selected for study. In this study, an effort is made to find out the availability and accessibility of electronic resources in the dental college libraries. It is our fond hope that this study would be very useful to the dental professionals' community.

4. RESEARCH METHODOLOGY

The research tools are employed to elicit primary information for the study. So Survey method has been employed to study and questionnaire is used in the quantitative phase derived from systematic content analysis of information obtained from related literature. Majority of questions developed were scaled questions to explore the e-resources available in dental college libraries.

5. OBJECTIVES OF THE STUDY

1 To explore the e-resources available at Dental college libraries
2 To explore the optimal access of e-resources by dental professionals
3 To explore the optimal use of e-resources by dental professionals
4 To explore the availability of e-resources in different form
5 To explore the usefulness of e-resources
6 To explore the availability of infrastructure to access the e-resources
7 To explore the mobilization of fund through e-resources
8 To explore the consortia based e-resources
9 To explore the availability of different network based e-resources

6. DATA ANALYSIS

The data collected were carefully scrutinized and variables for each question had been identified and tagged using Statistical Package for Social Science SPSS (10 version). The data analysis was based on questionnaire responses of thirty one dental libraries as shown in the table 1. Totally there were 40 questionnaire distributed out of which 31 were responded which had been considered as database for present study. The group of dental libraries surveyed ranged widely in terms of availability of electronic collections, services, infrastructure facility, database, internet usage of e-services etc.

Table 1 Response of the Dental Libraries

Sl. No.	Description	No of Libraries
1	Number of questionnaires distributed	40
2	Number of dental libraries responded	31
3	Percentage of Response	77.5%

6.1 Availability of E - Resources

Table 2 Availability of E-Resources in the Libraries

Sl No.	Sources	No. of Libraries	Percentage
1.	E-journals- Full Text	20	64.5
2.	E-journals- Abstracts	18	58.1
3.	E-Books	18	58.1
4.	E-News Papers	9	29.0
5.	Encyclopedia – Online & CD Based	11	35.5
6.	E-Thesis & Dissertations	8	25.8
7.	E-Dictionaries	9	29.0

8.	E-News Letters	6	19.4
9.	E-Directories	5	16.1
10.	E-Conference Proceedings	2	6.5
11.	E-Patents	1	3.2
12.	E-Reports	1	3.2
13.	E-Standards	1	3.2

This table shows that 20 [64.5%] libraries have access to e-journals with full text and 18 [58.1%] of libraries have access to e-journals with abstract. Eleven [35.5%] libraries have encyclopedia-online & CD based collection. Reference sources like E-theses and dissertations, e-directories are available as 8[25.8%], 9[29%], 5[16%] respectively.

6.2 Availability of E-resources in Different Medium

There are different forms to store the information; they are floppy disks, CD's, DVD's, USB ports, pen drive, etc. These medias can able to store large amount of information in digitized form. This table shows the availability of different storage medias in dental colleges.

Table 3 Availability of E-resources in Different Medium

S N	Different medium's of E-sources	No. of Libraries	%
1	Floppy Disks	10	32.3
2	Compact Disks	22	71.0
3	DVD'S	4	12.9
4	Microfiches	00	00
5	Microforms	00	00
6	USB Port	1	3.2
7	Magnetic Tapes	00	00
8	Internet	22	71.0
9	Others	2	6.5

This table shows the availability of different storage medium to store and gives access to e-resources. 22 [71%] libraries have CD-ROM e-resources, 4 [12.9%] libraries have DVD e-resources, 10 [32.3%] libraries have floppy disk e-resources and 30 [96.7%] libraries have internet connection. This result shows that the status of electronic resources in dental colleges is more in the form of internet collection.

6.3 Type of Sources Accessible through Consortium

Shared subscription or consortia based subscription means a strategic planning through which number of institutions having more or less the same information needs & requirement for fostering the library services to their users. The collective strength of consortia members facilitates the libraries to get the benefit of wider access to electronic resources at affordable cost and at the best terms & conditions. The entire major consortium covers the e-journals, e-books, e-reference sources like encyclopedia, dictionaries, year books, etc.

Table 4 Type of Sources Accessible through Consortium

S. No.	E-Resources in Consortium	No. of libraries	%
1	Journals- with Full Text	22	71.0
2	Journals-with Abstracts	19	61.3
3	Text Books	19	61.3
4	Reference Books	-	-
4.1	Encyclopedias	3	9.7
4.2	Dictionaries	6	19.4
4.3	Directories	3	9.7
4.4	Year Books	8	25.8
4.5	Bibliographic Sources	2	6.5

This table shows the different types of e-resources included in the consortia. 22 [71%] libraries include the e-journals with full text and 19 [61.3%] libraries included with abstract.19 [61.3%] libraries include e-books and reference resources like dictionaries, directories, year books, bibliographic databases included in the consortium. All other consortia like DELNET, UGC-INFONET, INDEST, etc. too include the above said information resources.

6.4 Infrastructure Facilities Provided to Access E-Resources

To offer any kind of services in libraries need good infrastructure facilities, without which any organisation can't function their routine activities. There are many infrastructure facilities to access the electronic resources.

Table 5 Infrastructure Facilities Provided to Access E-Resources

Sl. No.	Infrastructure	No. of Libraries	%
1	Computers	31	100.0
2	Internet	31	100.0
3	Floppy Disks	27	87.1
4	CD-Drives	24	77.4
5	DVD-Drives	11	35.5
6	Campus Network	9	29.0
7	Television	17	54.8
8	VCR	14	45.2
9	DVD Player	11	35.5
10	LCD	15	48.4
11	Powers Back up with UPS	23	74.2
12	Battery	15	48.4

13	Generator	00	00
14	Computer Programmer / Network Administrator	13	41.9
15	Others	1	3.2

27 [87.1%] respondents have floppy disks form of information resources and they have floppy for storing the information downloaded by the users. More than 50% of libraries are provided with television, VCR, DVD player, etc. 23 [74.2%] libraries provide back up services with UPS, 15 [48.4%] libraries provide with battery. 13 [41.9%] libraries appointed one computer programmer/ Network administrator each for maintaining the digital library/active-learning center under the supervision of librarian.

6.5 Different Forms of Library Network

There are many ways to interconnect the peripherals in the libraries. They are 1.Network within the library, 2. Network within the campus and 3. Network outside the library.

Table 6 Different Forms of Library Network

S. No.	Networks	N=31	
		No.	%
1	Network with in the Library	15	48.38
2	Network with in the campus	7	22.6
3	Network with out side the campus	0	00.0

This table suggests that, majority of libraries have network with in the library.38.7% of libraries had network within the library. Very meager no. of libraries had campus networks. With this result, we may conclude that libraries do expand their network at least within the campus. This enables the health science user community to access information outside the library. So that user community can access the services like off campus services, web page services and e-mail services also.

6.6 Frequency of Permitting the Users to Access E-Sources

The resource should be used at optimum level and then only the objective of any organisation can be fulfilled. This depends on the way of permitting the users to access the e-resources.

Table 7 Frequency of Permitting the Users to Access E-Sources

S. No.	Networks	1hr	2hrs	3hrs	4hrs	4 +hrs
1	Daily	7 (22.6)	4 (12.9)	2 (6.5)	1(3.2)	10 (32.3)
2	Alternative days	1 (3.2)	0	0	0	0
3	Twice in a week	1 (3.2)	1 (3.2)	00	1 (3.2)	00
4	Weekly	00	1 (3.2)	00	00	00
5	Fortnightly	00	00	00	1 (3.2)	00

This table reveals that majority of the libraries are allowing their user community to access e-resources without any limitation. 32.3% of the libraries allowing their users to access sources without time barrier. Some of the libraries are permit their users for 1hr [22.6%], 2hrs [12.9%], 3hrs [6.5%], 4hrs [3.2%] to access the e-sources.

6.7 Extent of Usage of E-Sources by Users

To improve any service provided by the libraries depends on the extent of use. The services that are accessed at maximum rate will have limited access. This helps to improve such services.

Table 8 Extent of Usage of E-Sources by Users

S.No.	E-resources	High	Average	Min	Never
1	Journals	16 (51.6)	7 (22.6)	1 (3.2)	-
2	Books	5 (16.1)	10 (32.3)	4 (12.9)	1 (3.2)
3	Reference	7 (22.6)	4 (12.9)	6 (19.4)	00
4	News Paper & Magazines	2 (6.5)	3 (9.7)	5 (16.1)	1 (3.2)
5	Databases	1 (3.2)	4 (12.9)	2 (6.5)	2 (6.5)
6	Web OPAC	4 (12.9)	-	2 (6.5)	2 (6.5)
7	Others	00	1 (3.2)	00	00

This table reveals the extent of using e-resources. 51.6% of institutions had access to the e-journal at maximum extent for their academic work. Books, reference sources, newspapers and databases had limited access.

6.8 Mode of Internet Access

There are many ways to access the internet namely telephone line, lease line, V-sat, broadband, etc. These differ from one internet connection to other by the speed of access. Nowadays broad band and V-sat are the most accessing internet connections.

Table 9: Mode of Internet Access

S. No.	Mode of Internet Access	N=31	
		No.	%
1	Telephone line	12	38.7
2	Lease line	04	12.9
3	V-Sat	01	3.2
4	ISDN/Dish net	02	6.5
5	Broadband	10	32.3
6	Others	02	6.5

This table shows that all the libraries have access to internet for their libraries. Majority of the libraries 12 [13.7%] out of 31 respondents have internet access through telephone line. Four [12.9%] libraries have internet access through leasedline. One [3.2%] library has internet access through V-SAT. Two [6.5%] libraries have internet access through ISDN/Dishnet. Ten [32.3%] libraries have internet access through Broadband. Two[6.5%] libraries have other type of internet connection. As broadband connection is limited to the metropolitan cities, leased line & V-SAT connection are having some technical problem in rural areas.

6.9 Downloading of E-Resources

The information accessed through internet or other forms of electronic resources need to be downloaded for further reading. There are many storage media to down load e-resources. They are floppy disks, CDs, DVDs, USB ports etc. It is possible to take printouts of the same to read the information which is downloaded, as some of them are uncomfortable to read in electronic form.

Table 10 Downloading of E-Resources

Sl. No.	Downloading	N=31	
		No	%
1	Floppy Disk	18	58.1
2	CD's	21	67.7
3	Mail Attaching	10	32.3
4	Printouts	18	58.1
5	USB Ports	03	9.7
6	Others	00	00

This table reveals that the different mode is used by the users community to download the e-resources. Majority of the users [58.1%] download the e-resources to floppies. Majority of the users [67.7%] download the e-resources to CDS. 58.1% of users get printouts, as they feel uncomfortable to read with the soft copies. Though information technology dominats our all walks of life, it can't surpass the traditional method. 9.7%of users download e-resources to USB Ports.

6.10 Mobilizing of Library Fund

To undertake any kind of job, fund is needed. Without that any job cannot be successfully completed. Libraries also mobilize the fund through different modes. The following table shows the possible ways to promote the library funds.

Table 11 Mobilizing of Library Fund

S. No.	Through	N=31	
		No.	%
1	Charging the use of e-sources on hour basis	6	19.4
2	Charging membership fee to use e-sources	5	16.1
3	Charging deposit fee	8	25.8

The above table reveals what are all the ways to charge the users for e-services in the libraries. 25.8% of libraries mobilizing the fund through charging deposit fee. Some other libraries [19.4%] charge based on hour basis for e-services and 16.1% of libraries are mobilizing through membership fee for the libraries. This will create an idea that we may not pay anything for the e-services or internet. They will think that we have paid only for the library membership. Overall conclusion is that more than 50% of libraries charge directly or indirectly.

7. CONCLUSION

The survey-oriented study reveals that dental college libraries have given more importance to provide access to electronic resources. They are provided with good number of infrastructure facilities in terms of computers, internet facility, back up services etc. Majority of libraries have internet connection and member for HELINET-Consortium. Some of the libraries mobilize the library fund through electronic resources and services. Professionals should be trained in using novel ICT tools and technologies. Through consortia and networks there is a big scope of saving funds that are otherwise spent unnecessary when the individuals subscribe the journals, books, etc. However the role of Information Technology & Telecommunication Technologies can't be ignored. This study concludes that LIS professionals should be well aware of the electronic resources available in the field of study concered and evaluate them before acquiring/subscribing them for their library users.

REFERENCES

[1] M.Anandamurugan and Murugesapandian, "Electronic Information Resources in Business and Management: A Case Study of Selected Online Publishers", Electronic Information Environment and Library Services: A Contemporary Paradigm, 2003, pp.1-8.

[2] Anne Morris, "Experimental Evaluation of Selected Electronic Document Delivery Systems", Journal of

Librarianship & Information Science, Vol.31 No.3, Sep1999.

[3] Chandana Goswami, "Information Availability and Accessibility:The Role of MIS", FID, Oct 1998.

[4] Ghislaine Chartron, "Electronic Resources and Documentary Consortia: A Survey of French Scientific Institutions", Journal of Librarianship and Information Science, Vol.33 No.2, 2001, pp.85-96.

[5] R.Guruprasad and Khaiser Nikam, "Use of Electronic Information by Scientists at the National Aerospace Laboratories", National Seminar on E-Publications, MGNIRSA, Hyderabad, 23 – 24 March 2006,

[6] Laura B Chonen and Mathew U Cslacada, "Web Accessible Databases for Electronic Resources Collection: A Case Study & Implications", Electronic Library, Vol.21 No.1, 2003, pp.31-48.

[7] Nithyanandam, K. and Others, "Usage of Electronic Resources by Students of Anna University Library, Chennai: A Survey", National Seminar on E-Publications, 23rd – 24th March 2006, MGNIRSA, Hyderabad.

DIGITAL INFORMATION LITERACY AND THE ROLE OF LIBRARIES: A SURVEY AMONG RESEARCH SCHOLARS OF SAMBALPUR UNIVERSITY

Bulu Maharana[1] and Sangeeta Mishra[2]
[1]Lecturer, P.G.. Department of Library and Information Science, Sambalpur University, Orissa
[2]Student, P.G. Department of Library and Information Science, Sambalpur University, Orissa
E-mail: bulu_maharana@yahoo.com
(Received on 26 July 2007 and accepted on 20 August 2007)

Abstract

The paper describes a brief report of the survey of digital information literacy among M.Phil and Ph.D scholars of the science faculties of Sambalpur University. A detailed analysis and discussion of the data obtained through questionnaires has been made. This paper also discusses the concept of digital information literacy, its essence in the present digital environment and the role of libraries for the promotion of digital information skills of the users. The survey reveals that 37 (82.2%) out of 45 scholars feel that library has a greater role to play for the promotion of digital information literacy among its user community. The survey suggests that the University should start inter-disciplinary initiatives to promote digital information literacy, with active collaboration from the Departments of Computer Applications, Library and Information Science, and the other core areas of study, actively engaged with research activities. This joint venture will help to orient the research scholars about the available accessibility, and use of digital resources in their area of research.

Index Terms: *Information literacy, Digital information literacy,Iinformation literacy-survey, Digital competencies*

1. INTRODUCTION

In the age of information explosion and information overload, the society is undergoing numerous transformations due to rapid development and diffusion of information and communication technologies (ICTs) in all walks of human life. They are irresistible intruders into various fields, such as, education, business, health, agriculture, production, etc. As a result of these complexities, information technologies have marked ahead concurrently at a rapid rate to facilitate dissemination of information in digitized media [1].

Information users are bewildered by a variety of digitized information. The process of identifying and selecting the specific information has become an extremely complex task. Many users fail to properly locate, evaluate, and use internet based information due to lack of understanding of technology and the structure of internet based information [2].

Due to complexities of information in electronic form, the users are unable to access, collect and retrieve it. Hence, in this crucial condition, it is the need of the day to empower the users to provide right and effective direction to access digital information, which can be effectively practised by the promotion of information literacy (IL) in digital era [3].

With the above background, the present survey has been undertaken in order to study the digital information literacy and digital competency level of the M. Phil and Ph.D scholars of the science faculties of Sambalpur University and to set the priority areas for promotion of digital information literacy among the academic and research community.

2. DIGITAL INFORMATION LITERACY

21st century literacy is the set of abilities and skills where oral, visual and digital literacy overlap. Hence, people of the century should be digitally literate in order to access the internet, find, manage and edit digital information. Every day new innovations and ideas are generated in the field of information technology. Hence, in order to cope with the situation, one has to face the changes of the upcoming technology, and digital literacy need to be practised among the users in the digital era.

In simple terms, digital literacy is the ability to properly use and evaluate digital resources, tools, and services and apply it to the learning process. Paul Gilster [4] defines

digital literacy as "the ability to understand and use multiple form of information from a wide range of sources when it is presented via computers". Digital literacy is a set of skills to access, evaluate, collect, and use digital information and sources in an effective way.

3. METHODOLOGY AND SCOPE

Survey method has been adopted to accomplish the study under report. A structured questionnaire seeking information on personal details of the respondent, level of computer literacy, digital information competency, training and orientation, role of library, etc was designed and distributed among the M. Phil and the Ph.D scholars of Science faculty of Sambalpur University. Out of 72 scholars (52 M. Phil and 20 Ph.D), 45 returned the duly filled in questionnaire in time. The data obtained from the responses were tabulated and interpretations were drawn.

4. ANALYSIS OF DATA AND DISCUSSION

Analysis denotes critical examination of assembled materials, keeping in mind the purpose of study and its possible bearings in a scientific discovery [5]. In the present survey, 45 scholars responded and the data provided by them have been analysed as follows.

4.1 Computer Literacy

The survey reveals that all 45 (100%) scholars who responded to this survey are computer literate. Most of them have received informal and others received formal education in computer application. The following figure exhibits the types of computer education they have received.

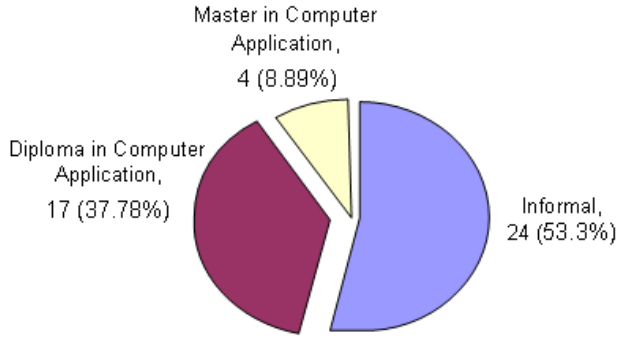


Fig. 1 Computer Education Scholars

It is clear from the above Pie Chart that more than half of the scholars, i.e. 24 (53.3%) have informal education in computers either by self learning or by the help of their fellow students and teachers. However, 17 (37.78%) students have completed their diploma in computers and 4 (8.89%) scholars have studied Master level courses in computer applications.

4.2 Competencies in Computer Applications

In reply to the question regarding level of computer competencies, the responses of the scholars have been represented in the diagram given below:

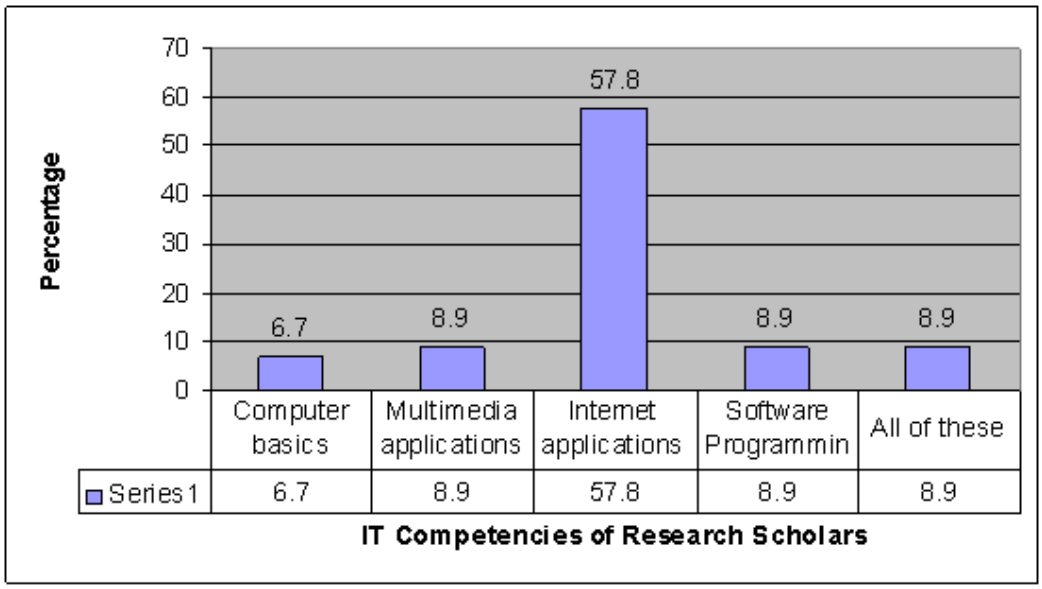


Fig. 2 Computer Competencies of the Scholars

Figure 2 reveals that a majority of the scholars, i.e. 26 (57.8%) have the knowledge of internet applications. This shows that internet has become one of the important media for information haunting and a useful tool for research. However, 4 (8.9%) scholars, each has the competency of multimedia applications and software programming. 3 (6.7%) scholars have learnt basic of computer only. Only 4 (8.9%) scholars have knowledge in all the areas of computer applications as mentioned in the above figure.

4.3 Computer Courses as a Part of their Course Syllabus

At present, the applications of computer has become mandatory for all subjects. The data reveals that out of 45 respondents, 40 (88.89%) have studied computer applications as a part of their course.

4.4 Use of Instructional Tools and Packages

The figure 3 exhibits that 44 (97.8%) students have used different instructional materials in floppies, followed by 35 (77.8%) scholars who used CD-ROMs. However, only 10 (22.2%) scholars have used DVDs and none of them have ever used subject specific software.

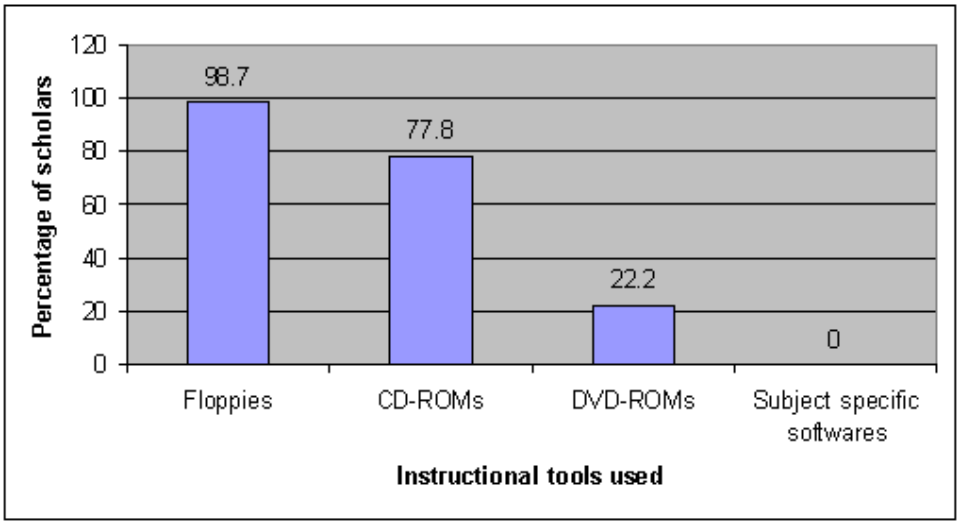


Fig.3 Instructional Tools used by the Scholars

4.5 Use of Scholarly E-Resources

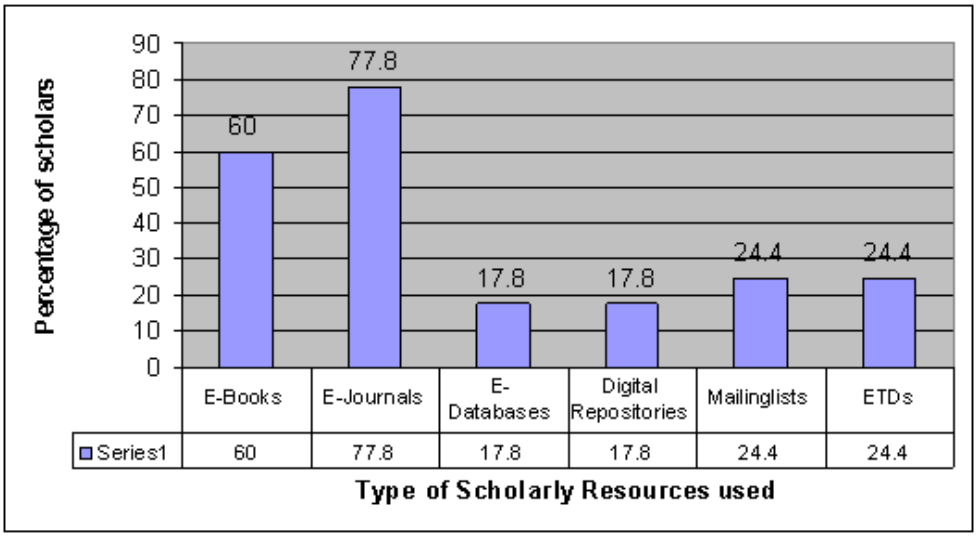


Fig.4 Type of Scholarly E-Resources used by the Scholars

The figure 4 indicates the pattern of use of scholarly resources in digital form by the respondents under study. It is observed that e-journal is the most popular form of e-resource that 35 (77.8%) scholars are using. Next to e-journals, e-books are another form of e-resource in which 27 (60%) scholars are using them for their study and research. Electronic theses and dissertations and news groups/mailing lists are used by 11 (24.4%) each scholars. Similarly, 8 (17.8%) scholars use e-databases and digital repositories.

4.6 Knowledge of Searching, Identifying and Downloading Information from the Web

The data obtained from the responses reveals that there is a positive trend among the research scholars of science subjects to acquire knowledge and skill to search, identify and download the required information from the internet. 42 (93.3%) scholars have replied positively to the question whether they are competent to search, locate and retrieve information they need from the internet.

4.7 Evaluation of Web Resources

Evaluation of web resources is very much needed before it is put to use for further research. There are various criteria for evaluation, which include authenticity, reliability, sustainability, authority, etc.

The survey discloses that most of the scholars, i.e. 32 (71.1%) scholars consider 'usability' as the most important criteria for evaluation of the web resources. A few of them, 13 (28.9%) and 11 (24.4%) scholars consider 'reliability' and 'authenticity' respectively as the most important criteria for evaluation of digital resources.

4.8 Use of Documents in PDF Format

Most of the scholarly electronic documents are stored in PDF formats. The users should know how to use them and should know downloading of free acrobat reader software for accessing of resources.

The survey reveal that more than half of the scholars, i.e., 26 (57.8%) scholars know the use of acrobat reader and documents in PDF format. However, 18 (40%) scholars do not know the usage of PDF format.

4.9 Copy Right of Electronic Resources

A significant number of respondents, 28 (62.2%) are of the opinion that copyright is one of the most important issues associated with the use of digital information. However, 18 (40%) of the scholars are well aware of digital copyright matters.

4.10 Training/Orientation on the Use of Digital Resources

While 41 (91.1%) scholars feel that a training/ orientation programme on the use of digital resources is essential, 23 (51.1%) scholars have already undergone training in this area. The following figure shows different modes of training the scholars use the digital resources effectively.

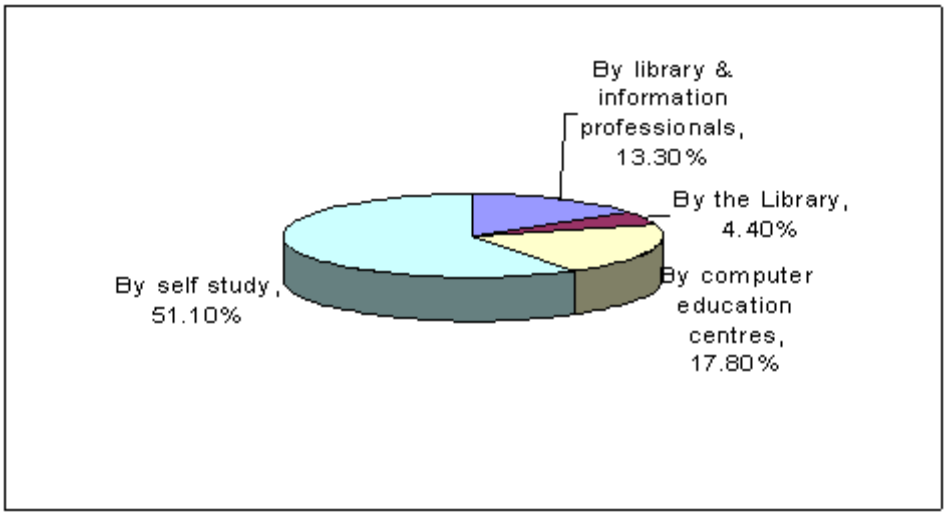


Fig.5 Training/Orientation received by the Scholars

The above table indicates that most of the scholars i.e., 23 (51.1%) have trained themselves by self learning process. However, 8 (17.8%), 6 (13.3%), and 2 (4.4%) scholars have been trained by a computer centre, information professional, and by the library respectively.

4.11 Role of Library for the Promotion of Digital Information Literacy

37 (82.2%) scholars feel that library has a greater role to play for the promotion of digital information literacy among its users. As per the survey, the respondents have indicated the following techniques to be used for information literacy programme at the library:

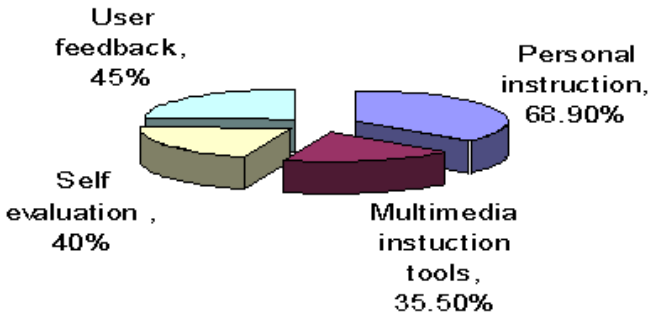


Fig.6 Techniques for Promoting Digital Information Literacy

4.12 Medium to be Used for Information Literacy Programmes

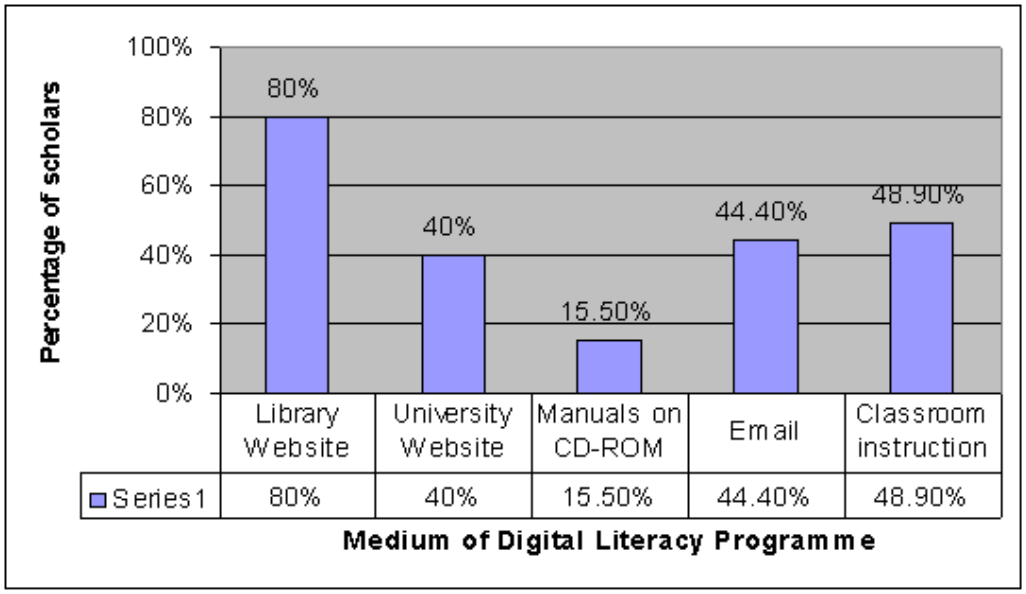


Fig.7 Medium of Digital Literacy Programme

The scholars have opined that the following meda used for information literacy programmes would be undertaken by the Library.

Table indicates that 36 (80%) would like to have training/ orientation through the library website. If it is there, anybody will be able to train himself by browsing the library website from anywhere. 22 (48.9%) and 20 (44.4%) scholars want personal interaction/classroom session and email respectively to be the medium for information literacy programme. Only 7 (15.5%) are of the opinion to have manuals on CD-ROM.

5. MAJOR FINDINGS OF THE SURVEY

1 It was found from the survey that all M. Phil and Ph.D scholars of science faculties of Sambalpur University has computer competencies and digital information literacy.

2 26 (57.8%) scholars have knowledge of internet applications, resources, and services. They have necessary skills of searching, retrieving, and making use of the web information for their research. Less than half of them are still to have adequate knowledge of internet applications.

3 E-journals were found to be the most popular form of electronic resources that the scholars are using followed by e-books. But a lot of awareness is required for them towards the use of other internet resources such as e-databases, electronic theses and dissertations, institutional repositories, mailing lists, newsgroups, etc.

4 Most of the scholars requested that the library should take a lead role for the promotion of digital information literacy among the research scholars of the University. Further, the scholars requested that personal instruction and instructions through Library websites might be useful techniques for spreading digital information literacy.

6. SUGGESTIONS

After a careful analysis of the present state of digital information literacy of the M. Phil and the Ph.D scholars, the investigators have putforth the following suggestions:

1 The University should start an inter-disciplinary initiative to promote digital literacy among the academic and research community. The department of Computer Applications, Library and Information Science along with the core departments should join this venture to make aware the research scholars aware of the availabe accessibility and use of digital resources in their area of research.

2 The students should get an exposure to the digital resources right from their schools on internet search techniques, online information retrieval, use of multimedia information kits, searching, locating, evaluating, and using information sources.

3 Library orientation programmes should be conducted in the beginning of each academic session in order to instruct the freshers on how to use the digital materials available in the library.

4 The vendors of different digital products could be requested to conduct orientation or training sessions on how to use the resources.

5 Different instructional materials, explaining the availability and procedure to use the digital resources in CD-ROMs, floppies, or hard copy of the manuals be distributed to the research scholars.

6 Proper plans and policies should be made at the institutional level to develop digital information infrastructure at the University level.

7. CONCLUSION

The significant change in the digital era affect the information users in various ways. There is an educational imbalance between rapidly developing technologies, knowledge and competency of the users. Majority of the users lack of having necessary skills on digital technology. Hence, educating the people to use information technology and to take the advantage of vast information resources in digital format has become one of the important educational objectives for the research community. The present study intended to find out to what extent the research scholars are aware of the available stock of digital resources and whether they have the necessary skill to make use of them. Although, the scholars have basic knowledge of digital information, they still need a systematic programme to enhance their digital information competencies further.

REFERENCES

[1] K.L.Anita, “Information Literacy in the Electronic Age”, Research Strategies, Vol. 8 No. 1, 1990. pp. 220-227.

[2] C.D.Bawden, “Information and Digital Literacies: A Review of Concepts”, Journal of Documentation, 2001, pp. 22-33.

[3] D.K.Sugathri, “Information Literacy and Its Need: A Case Study of Students of Andhra University”, Proceedings of SIS-2005, 27-29 Jan 2005, pp. 309-315.

[4] P.Gilster, Digital Literacy, Vol. 6, 1983. pp. 67.

[5] P.V.Young, “Scientific Social Surveys and Research”, Prentice Hall, New Delhi, 1996, pp. 340-341.

A SCIENTOMETRIC ANALYSIS ON TUBERCULOSIS RESEARCH IN INDIA

Dr.S.Ravi[1] and L.Mohan Kumar[2]

[1]Professor, Department of Library and Information Science (DDE), Annamalai University, Tamil Nadu

[2]Research Scholar, Department of Library and Information Science, Annamalai University, Tamil Nadu

(Received on 27 July 2007 and accepted on 25 August 2007)

Abstract

India leads the world in the incidence of tuberculosis (TB), accounting for 23% of global burden of the disease and holds the 15th position in terms of incidence per 1,00,000 population. India accounts for only about 5–6% of the world's research output in this area as seen from papers indexed in three international databases, viz. Pub Med, Science Citation Index and Biochemistry and Biophysics Citation Index over ten-year period from 1997 to 2006. It raises the question 'should resource-poor countries invest in research or should they depend on research performed elsewhere and invest their meager resources predominantly in health-care measures?. We argue that India should invest much more in research than they do. We have also mapped TB research identified institutions and cities active in research, journals used to publish the findings, use of high impact journals, impact of their research as seen from citations received and extent of international collaboration.

Index Terms: *Scientometric analysis, Tuberculosis research*

1. INTRODUCTION

This paper is based on the premise that collecting better and more comprehensive data is the first step in the development of a health policy. It addresses two issues, both based on the published literature. The first concerns the need for developing countries to perform research in diseases that are of great concern to them and the second concerns mapping tuberculosis (TB) research in India. We try to provide an analysis of the volume, nature and quality of TB research in India and attempt to make some concrete suggestions for policy changes. Approximately 1.86 billion people – about one-third of the world's population – are infected with the TB bacteria. The annual incidence of TB rose from 8 mil-lion in 1997 to 8.4 million in 2000 and it is expected to rise further to 15.2 million new cases a year by 2010. Annually, 1.9 million people die from the disease [1].

TB continues to be a major health problem in developing countries where it is now one of the most common causes of death. Indeed, as pointed out by Frieden et al. [2], the current approach to control TB advocated by WHO and the International Union against Tuberculosis and Lung disease is strikingly similar to the one pursued by Biggs. The only difference now is that HIV has changed the epidemiology of TB. Internationally, 8% of TB cases are due to HIV, but in some countries in sub-Saharan Africa, the figure has risen to 75% [3].

2. PURPOSE OF THIS STUDY

There are many reasons why TB research is important and should be accorded high priority in countries like India. For one, India has highest incidence of TB and deaths due to TB. Advanced countries have very little incentive to invest in TB research – at moves to allocate a substantial sum of $640 million for TB research, thanks to a report of the National Academy of Sciences and persistent efforts by Congressman Sherrod Brown. Although it is widely accepted that investments in health research have been among the most cost-effective investments over the past several decades and that the 20th century health revolution appears to have resulted far more substantially from the generation and application of new knowledge [3], the great imbalance between investments in health research and the global burden of disease persists [4]. Even though 85% of the global burden of disability and premature mortality occurs in the developing world, less than 4% of global research was devoted to diseases and disorders that dominate the burden of disease in developing countries. By the early 1990s, while TB was responsible for 2.8% of the entire burden of ill-health in the world, research on TB was US $33 million in 1993, counted for less than 0.1% of the world's expenditure on health research and development [5]. Funding for health research expressed as expenditure per DALY (disability adjusted life year) in 1990 and 2020 was ridiculously low for TB compared to asthma and blindness.

3. METHODOLOGY

This study is based on the papers published on TB research in India available in three databases, viz. Pub Med (web edition), Science Citation Index (SCI), and Biochemistry and Biophysics Citation Index (BBCI). For this analysis, all papers published over the period of ten years from 1997 to 2006 are taken. The way bibliographic data presented differs from database to database, and some papers have been indexed in more than one database. Therefore, special efforts were made to unify the data and to eliminate duplicates.

4. RESULTS AND DISCUSSION

There were 1310 unique papers from India, consisting of 954 articles, 144 letters, 109 notes, 93 meeting abstracts and 10 editorials. Out of more than 38,820 TB papers indexed by Pub Med, India's share is 5.34%, in SCI 0.49% and in BBCI 0.94% which is even lower, whereas Indian research is indexed well in both these databases ie.5.75% of the 9542 papers in SCI and 7.51% of the 959 papers in BBCI. Pub Med indexes a larger percentage of the respective country's TB research papers than either SCI or BBCI. However, Indian researchers publish a higher per cent of their work (39.70%) in journals indexed by SCI. One reason for this is that while virtually the entire research output from India is published in English Journals.

4.1 Country-wise Contribution to the World Literature on TB

Table 1 Contribution of India to the World Literature on TB

	No. of papers	Percentage world share in research
Word	38,820	
USA	8,450	21.76
UK	1,411	3.63
German	25,413	65.46
EU-15*	5,03	1.30
Nordic countries#	2,84	0.73
Australia	175	0.45
Israel	150	0.39
India	1,310	3.38
China	150	0.39
Brazil	156	0.40
Mexico	135	0.35
South Africa	593	1.53
Kenya	90	0.23

*Science Citation Index- Calculated from the data for the year 2006 provided by WHO

Table 1 shows the developing countries, such as Brazil, Mexico, Kenya, Nigeria and Egypt have also recorded poor ratios of research to incidence. In contrast, USA and UK with hardly any incidence (below 0.2%) were responsible for more than 21.76% and 3.36% of world research in TB. The G7 countries, accounting for about 65.46% of incidence, were responsible for more than 62% of world research and the European Union (minus Luxembourg), accounting for less than 1.30% incidence.

Table 2 Journals Used to Publish Frequently Cited Indian Research Papers
Citations seen from SCI and BBCI 1997-2006

Journal	Country of publication	Impact factor (JCR 2006)	No. of papers	No. of cited papers	No. of citations
Tubercle and Lung Disease	GB	A	125	48	244
Lancet	GB	16.140	20	12	230
American Journal of Gastroenterology	US	2.344	23	15	123
Clinical Radiology	GB	0.946	10	9	97
Infection and Immunity	US	3.713	12	4	104
Journal of Neurosurgery	US	2.999	9	6	104
Vaccine	GB	1.949	9	6	87
Gene	NL	1.838	15	12	75
Journal of Infectious Diseases	US	5.099	6	6	92
AIDS	GB	5.05	8	2	68
International Journal of Dermatology	US	0.676	14	14	72
Antimicrobial Agents and Chemotherapy	US	3.56	14	6	66
Gut	GB	4.546	3	3	64
International Journal of Leprosy and other Mycobacterial Diseases	US	0.784	30	20	42
Acta Cytologica	US	1.425	24	12	40
Indian Journal of Medical Research	IN	0.318	56	26	45
Indian Pediatrics	IN	A	130	32	49
Neuroradiology	DE	0.754	8	6	58
Indian Journal of Chest Diseases and Allied Sciences	IN	A	62	18	45
American Journal of Roentgen logy	US	2.332	18	14	46
Chest	US	2.314	8	6	46
136 other journals cited at least once			569	90	897
90 other journals with no citation			139	0	0
Total			1310	567	2664

A - not indexed in JCR 2006.

4.2 Distribution by Journal

Indian researchers have published in 247 journals from 20 countries in ten years (including 400 papers in 28 Indian journals). Table 2 lists journals published in which Indian papers were cited not less than 12 times by the end of 2006. Journals often used by Indian researchers to publish their findings are Tuberculosis and Lung disease (125 papers and 244 citations), Indian Pediatrics (130 papers, 49 citations), Journal of the Association of Physicians of India (42 papers, 15 citations) and Journal of the Indian Medical Association (35 papers, 9 citations).

Table 3 Distribution of Indian Papers by Impact Factor Range of Journals (based on JCR 2006)

Impact factor range	No. of journals	No. of papers	No. of cited papers	No. of citation
0.000	47	505	157	224
> 0.0-0.5	40	169	51	230
> 0.5-1.0	43	143	69	123
> 1.0-1.5	29	79	32	97
> 1.5-2.0	30	77	31	104
> 2.0-2.5	18	72	32	104
> 2.5-3.0	9	39	9	87
> 3.0-3.5	6	30	6	75
> 3.5-4.0	5	45	9	92
> 4.0-4.5	3	24	3	68
> 4.5-5.0	5	30	5	72
> 5.0-5.5	3	31	4	66
> 5.5-6.0	3	24	1	64
> 6.5-7.0	-	-	-	-
> 9.0	6	42	8	35
Total	247	1310	417	1711

4.3 Distribution by Journal Impact Factor

India has published a very large percentage of their papers in low-impact journals: 850 Indian papers published in journals which impact factor less than 1.0. Of these, 582 Indian papers have appeared in 47 non-SCI journals and 505 papers have appeared in 23 non-SCI journals (impact factor zero). Only a few papers have appeared in high impact factor (> 5.0) journals and any of these are meeting abstracts and letters. From India, there was one article and two letters published in New England Journal of Medicine (impact factor27.766), two articles and eight letters in Lancet (impact factor 16.135), two meeting abstracts in FASEB Journal(impact factor 14.629), one article each in Journal of experimental Medicine (impact factor 14.384) and Journal of Molecular Biology (impact factor 5.673),four meeting abstracts in Gastroenterology (impact factor10.250), one letter in JAMA (impact factor 9.258),one meeting abstract in Hepatology (impact factor 5.849) and one meeting abstract has been published in Brain Pathology(impact factor 5.663).

4.4 Distribution by Institution

In all, 196 Indian institutions have published at least one paper in ten years: 22 of them have published ten papers or more. Table 4 lists the institutions that publish often. These include All India Institute of Medical Sciences (AIIMS), New Delhi (139 papers and 438 citations), Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh (107 papers and 160 citations), Tuberculosis Research Centre (TRC),Chennai (111papers and 186 citations), and King Edward Memorial Hospital, Mumbai (47 papers and 71citations). India's output of TB research papers comes mainly from academia (639 papers) and hospitals (207 papers from 70 hospitals). Fourteen medical universities have published 313 papers, 16 general universities have published 60 papers, and 65 medical colleges have published 262 papers. Surprisingly, the research departments and councils of the central government, which are strong in physics and chemistry and to some extent engineering, account for only 14% of TB papers. Nine laboratories under the Indian Council of Medical Research have published 97 papers, five laboratories of the Council of Scientific and Industrial Research have published 15 papers, and three laboratories of the Department of Biotechnology have published 16 papers. Baba Atomic Research Centre, a constituent of the Department of Atomic Energy, has published 11 papers.

Table 4 Institution-wise Distribution

Subfield	No. of papers	No. of cited papers	No. of citation
All India Institute of Medical Sciences, New Delhi	139	49	438
Tuberculosis Research Centre, Chennai	111	40	186
Post Graduate Institute of Medical Education and Research, Chandigarh	107	40	160
Christian Medical College and Hospital, Vellore	45	16	124
King Edward Memorial Hospital, Mumbai	47	18	71
Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow	43	16	67
Maulana Azad Medical College, New Delhi	33	9	60
National Institute of Immunology, New Delhi	25	8	59
Institute of Nuclear Medicine and Allied Sciences, New Delhi	16	2	44
Madurai Kamaraj University, Madurai	16	3	41
Bombay Leprosy Project, Mumbai	13	1	37
WHO, South-East Asian Regional Office, New Delhi	15	1	37
Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram	35	12	36
Indian Institute of Science, Bangalore	28	7	30
Bhaba Atomic Research Centre, Mumbai	23	4	29
National Institute of Mental Health and Neurosciences, Bangalore	23	6	29
Foundation for Research in Community Health, Mumbai	18	4	27
St John's Medical College, Bangalore	20	6	27
University College of Medical Sciences, New Delhi	23	9	26
89 other institutions cited at least once	370	166	466
88 other institutions	147	0	0
Private address	13	0	0
Total	1310	417	1994

4.5 Distribution by City and State

About 61% of Indian papers come from four cities, viz. New Delhi (301 papers), Mumbai (141), Chennai (133) and Chandigarh (121). More than 68% of papers come from four states, viz.Delhi (301 papers), Maharashtra (199), Tamil Nadu(193) and the Union Territory of Chandigarh (140). Table 5 lists Indian cities and states involved in TB research.

Table 5 Cities and States Contributing to TB Research

	No. of papers	State	No. of papers
New Delhi	301	Delhi	231
Mumbai	141	Maharashtra	199
Chennai	133	Tamil Nadu	193
Chandigarh	121	Chandigarh	140
Bangalore	69	Uttar Pradesh	127

Lucknow	65	Karnataka	91
Vellore	51	Kerala	54
Thiruvananthapuram	50	West Bengal	43
Calcutta	40	Punjab	40
Varanasi	40	Rajasthan	40
Hyderabad	35	Andhra Pradesh	37
Manipal	34	Pondicherry	34
Pondicherry	34	Haryana	30
55 other cities	196	7 other states	57
Total	1310		1310

4.6 Highly Cited Papers

In all 1310 Indian papers in our dataset which have harvested 1994 citations, as seen from SCI 1990–2000 and BBCI 1997-2006. These include 14 papers from AIIMS five each from TRC and PGIMER, and three each from Christian Medical College, Vellore, and Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow. The two highest cited Indian articles are by P. Shankar et al. of AIIMS, and both of them were published in Lancet, one as a letter and the other as an article. These deal with the use of polymerase chain reaction in the identification of tuberculosis and the rapid diagnosis of tuberculosis meningitis. The diachronous distribution of citations to the highly cited papers is given in Table 6. Papers that received the first citation in the year of publication (1, 2, 4, 5, 8 and 12) have consistently been cited every year till 2006.

Table 6 Highly cited paper

No.	Cited paper	No. of times cited	Institution
1	Shankar, P. *et al., Lancet,* 1991, 337, 5–7.	111	All India Institute of Medical Sciences, New Delhi
2	Shankar, P. *et al., Lancet,* 1990, 335, 423–423.	59	All India Institute of Medical Sciences, New Delhi
3	Stanford, J. L. *et al., Vaccine,* 1990, 8, 525–530.	37	Bombay Leprosy Project, Mumbai
4	Brahmajothi, V. *et al., Tubercle,* 1991, 72, 123–132.	37	Madurai Kamaraj University, Madurai
5	Aisu, T. *et al., AIDS,* 1995, 9, 267–273.	37	WHO, South-East Asia Regional Office, New Delhi
6	Shah, S. *et al., Gut,* 1992, 33, 347–351.	32	Christian Medical College and Hospital, Vellore
7	Rajshekhar, V. *et al., J. Neurosurg.,* 1993, 78, 402–407.	32	Christian Medical College and Hospital, Vellore
8	Wallis, R. S. *et al., Infect. Immunol.,* 1993, 61, 627–632.	30	Tuberculosis Research Centre, Chennai
9	Gupta, R. K. *et al., Clin. Radiol.,* 1990, 41, 120–127.	28	Institute of Nuclear Medicine and Allied Sciences, New Delhi
10	Sehgal, V. N. *et al., Int. J. Dermatol.,* 1990, 29, 237–252.	27	10Maulana Azad Medical College, New Delhi
11	Khanolkaryoung, S. *et al., Infect. Immunol.,* 1992, 60, 3925–3927.	27	National Institute of Immunology, New Delhi
12	Bhargava, D. K. *et al., Am. J. Gastroenterol.,* 1992, 87, 109–112.	23	All India Institute of Medical Sciences, New Delhi
13	Dwivedi, M. *et al., Am. J. Gastroenterol.,* 1990, 85, 1123–1125.	22	Motilal Nehru Medical College, Allahabad

14	Kumar, L. *et al.*, *Pediatr. Infect. Dis. J.*, 1990, 9, 802–806.	21	Post Graduate Institute of Medical Education and Research, Chandigarh
15	Vansoolingen, D. *et al.*, *J. Clin. Microbiol.*, 1995, 33, 3234–3238.	59	Beijing Tuberculosis and Thoracic Tumor Research Institute, Beijing
16	Wang, J. *et al.*, *Anal. Chim. Acta*, 1997, 337, 41–48.	19	South-Central University for Nationalities, Wuhan
17	Cole, R. A. *et al.*, *Tubercle Lung Dis.*, 1996, 77, 363–368.	11	Beijing Research Institute of Tuberculosis Control, Beijing
18	Zhang, M. *et al.*, *J. Immunol.*, 1999, 162, 2441–2447.	11	Nanjing Medical University, Nanjing
19	Zhang, L. X. and Kan, G. Q., *Tubercle Lung Dis.*, 1992, 73, 162–166.	11	Beijing Tuberculosis and Thoracic Tumor Research Institute, Beijing
20	Zhou, A. T. *et al.*, *Clin. Diagn. Lab. Immun.*, 1996, 3, 337–341.	10	Beijing Chest Hospital, Beijing
21	Zhang, L. X. *et al.*, *Tubercle Lung Dis.*, 1995, 76, 100–103.	9	Beijing Tuberculosis and Thoracic Tumor Research Institute, Beijing
22	Lu, C. Z. *et al.*, *Lancet*, 1990, 336, 10–13.	8	Shanghai Medical University, Shanghai

4.7 International Collaboration

Table 7 International Collaboration Byline

No. of nations in the byline	No. of papers
One	612
Two	29
Three	6
Four	1
Five	3
Six	1
Nine	1
Total no. of papers	553
No. of papers internationally collaborated	41
Percentage papers internationally collaborated	7.69
No. of papers international links	69
Internationalization index	12.94

As seen from Table 7, 7.41% of papers (41of the 553 papers for which information on multiple Authorship was available) have resulted from collaboration with foreign authors. Overall, as seen from SCI 2006 (CD-ROM edition) data, 17.6% of papers in all Science and Technology are internationally coauthored [6]. In Mathematics and related fields such as Statistics, as seen from Mathsci 1998–2001, 15.1% of papers are internationally co-authored [7]. Thus, the extent of international collaboration for TB in India is rather low.

In all, researchers from 28 institutions have co-authored papers with foreign authors. The researchers have collaborated with authors from USA in 18 papers and authors from UK in 14 papers. TRC and AIIMS have collaborated with foreign laboratories in 11 and 5 papers, respectively. National Institute of Immunology, New Delhi, and National Institute of Mental Health and Neuron-Sciences, Bangalore, have collaborated with foreign authors in four papers each. Out of 41 internationally coauthored papers the researchers are mentioned as first authors in 16 papers only. The very high fraction of papers with first authors from outside India leads to the possibility of much of such collaborative research being 'Safari research' or research where scientists from advanced countries use local researchers merely to collect data, specimen and cases [8].

5. CONCLUSION

India has the greatest number of cases without access to good treatment. India needs to invest in TB research far more than they do now. Fortunately, the overall climate for research and combating TB is improving. The formation of Global Alliance for TB Drug Development, bringing together public agencies and private corporations as well as international agencies, the recent initiative of the British Medical Journals (BMJ) and WHO persuading leading commercial publishers to make their journals available on the web to scientists and doctors in the developing world either at no cost or at a very low cost. The G8 countries which met at Genoa in July 2001 coming forward to persuade multinational drug companies to sell TB drugs at a low cost to developing countries. On the research front, the elucidation of the complete genome of Tuberculosis has opened up several new avenues of research such as new anti-tuberculosis drug development targeted at newly recognized enzymes, or the development of new vaccines aimed at hitherto unknown antigens. To capitalize on this development, leaders of the world's largest drug companies, together with heads of the US National Institutes of Health and representatives of the Welcome Trust, are discussing the possibility of forming public–private partnerships to fund genomic research. Indeed, although significant obstacles remain, the prospects for the development of new and effective drugs against TB are much greater than at any time in several decades.

REFERENCES

[1] Brussels, "The Global Alliance for TB Drug Development", 23 March 2001.
[2] T.R.Frieden, B.H.Lerner and B.R.Rutherford, "Lancet", Vol.355, 2000, pp.1088-1092.
[3] World Health Organization, "World Health Report 1999", Geneva, Switzerland, 1999, pp. 1.
[4] C.M.Michaud, C.J.L. Murray, and B.R.Bloom, "J. Am. Med. Assoc.", 2001, pp. 535–539.
[5] Paul Nunn, "Annual Forum 3", Geneva, June 1999.
[6] S.Arunachalam, "The Web of Knowledge – A Festschrift in Honor of Eugene Garfield", Information Today Inc. and The American Society for Information Science, Medford, NJ, USA, September 2000, pp. 215–231.
[7] S.Arunachalam, "Scientometrics", 2001, pp. 235–259.
[8] B.Acosta-Cazares, E.Browne and R.E.La Porte, "Scientific Colonialism and Safari Research", Clinmed.

IMPLEMENTATION OF RFID TECHNOLOGY AT JRD TATA MEMORIAL LIBRARY : A CASE STUDY

M.Surulinathi[1], Dr. K. S. Chudamani[2], Dr. R. Balasubramani[3] and N.Amsaveni[4]
[1]IKM Trainee, NCSI, Bangalore, Karnataka
[2]Deputy Librarian, JRD Tata Memorial Library, IISc, Bangalore, Karnataka
[3]Assistant Librarian, Dayananda Sagar College of Engineering, Bangalore, Karnataka
[4]Ph.D. Scholar, Annamalai University, Annamalainagar, Tamilnadu
E-mail: surulinathi@ncsi.iisc.ernet.in
(Received on 28 July 2007 and accepted on 28 August 2007)

Abstract

Radio frequency identification or RFID is a generic term for technologies that use radio waves to automatically identify people or objects. There are several methods of identification, but the most common is to store a serial number that identifies a person or object, and perhaps other information, on a microchip that is attached to an antenna. The technology, though new to libraries, has been in use in other sectors for more than 20 years. RFID technology promises to change our world. It has the capability of making our personal and work lives in the library more convenient. RFID technology used in a reckless fashion can cause serious privacy concerns for users. A vendor who understands both RFID and libraries is better equipped to use the right technology in a library environment, and to use future developments in the technology to enhance, rather than compromise, user privacy. This study discusses RFID technology in libraries and shares their experiences about the technology which is implemented at JRDTML, Bangalore.

Index Terms: *RFID, Library Management*

1. INTRODUCTION

Radio Frequency Identification (RFID) is the technology that is slated to replace barcodes in library applications. It is a form of identification that is contact-less and does not require line of sight. Though this technology is new to libraries, it is being used in other sectors for more than two decades. The RFID tags are placed in books and covered with a property sticker. Antennas of different sizes, based on application, are used to read the tags and manage the various library functions. The RFID Solution is a revolutionary application of automatic identification and data capture (AIDC) technology. In a library environment, RFID technology resembles a traditional barcode system in that it provides a means of assigning an ID to an item and reading that ID to perform circulation transactions or to take inventory. In this paper, a detailed description of its implementation at JRDTata Memorial Library has been provided.

2. RFID TECHNOLOGY IN LIBRARIES

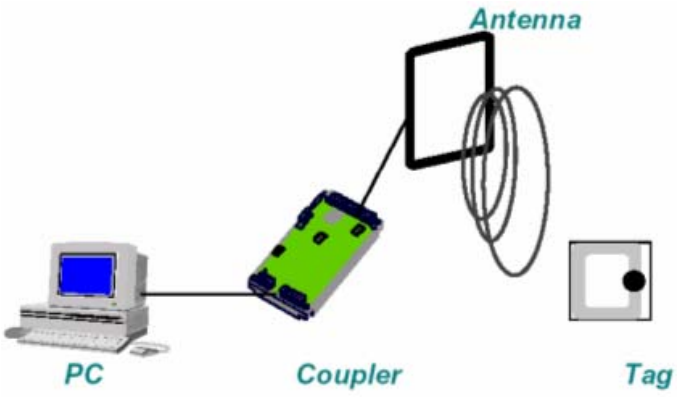
The most comprehensive application of RFID technology in libraries can be found in Singapore. Libraries in Singapore, under the leadership of the National Library Board, aggressively implemented RFID technology in their libraries [1]. A very large percentage of the public libraries in Singapore are already using RFID technology with remarkable results.

Libraries in the United States and the United Kingdom are also deploying RFID technology. Examples of the use of RFID technology in USA can be found in both public and academic libraries [2]. New Hanover County Public Library in North Carolina and City Library at Santa Clara California were among the very early implementers of this technology. Others like Sarasota County in Florida are sufficiently pleased with their pilot projects that they are expanding the program to cover all libraries. The economic case is clear – the use of RFID technology is accompanied with improvements in productivity, better levels of service to patrons, effectiveness of self-check stations and reduction in losses due to theft [3].

The technology, though new to libraries, has been in use in other sectors for more than 20 years. The RFID tags are placed in books and generally covered with a property sticker. Antennas of different sizes, based on

application, are used to read the tags and manage the various library functions.

A standard RFID system consists of four main parts:



a **RFID Tags** - Flexible, paper-thin smart labels that are applied directly to library items. Each RFID tag contains a tiny chip, which is both readable and writable and can store information to identify items in the library collection. In library applications, it also stores a security bit and if needed, information to support sorting systems.

b **Antenna** - A conduit between RFID tags and the coupler. RFID antennas emit radio waves that activate RFID tags as they pass through the activation field. After a tag is activated, it can send information to or receive information from the coupler.

c **Coupler** - It is a link between RFID tags and the PC. The coupler can send information in two directions: It can read information from a tag and send it to the PC (read mode), or it can read information from the PC and send it to an RFID tag (write mode).

d **PC -** It is a link between coupler and the library automation system. Necessary softwares have been developed to run on the PC to provide an interface between RFID hardware and the library automation system.

2.1 Borrowing Station

The Borrowing Station allows users to borrow items without assistance from librarian and as a result improves the through put of the borrowing function. The Borrowing Station is a self- service station.

The Borrowing Station can be configured to recognize a user by means of:

- PIN Code (password)
- Bar-coded identification card
- Smart card and
- Biometrics (finger print etc…)

2.2 Book Drop

The Book Drop can be located anywhere, inside or outside the library. Possible remote locations outside the library include railway stations, shopping centers, schools, etc. This offers unprecedented flexibility and convenience of returning library items at anytime of the day, even when the library is closed.

2.3 Remote Return Kiosk

The Remote Return Station can be located anywhere, inside the building, in public transport terminal or even along the road much to the convenience of users.

Serving almost the same function as Book Drop, for example, freeing librarians from labour-intensive loan cancellation activity and operating 24hrs & 7 days per week, Remote Return Station is the answer in providing value-added service to busy library users.

2.4 Sorting Station

Sorting of items using the Sorting Station is a breeze. The librarian simply puts the book on the sorting pad and the system immediately displays on the screen, which category and compartment the book belongs to. The system literally takes away the stress and strain associated with book sorting.

2.5 Counter Station

The Counter Station (CS) is a staff assisted station. At this station, staff is able to perform borrow and return on behalf of the user. At the same time, it can sort or separate out material according to its category. For new material, this station can program information into the tag. It also has a feature to check, activate or de-activate the security status of the tag inside the material.

2.6 Borrow

The counter station is configurable to recognize a user by following ways:

- Bar-coded identification card
- Magnetic card
- Contact or Contact less Smart card
- Biometrics (finger print etc)

To borrow an item, user passes membership card and library items to the staff. Staff select the borrow function and scans in membership card. The staff then place item(s) onto the "pad" in front of the station. The station captures the electronic signature of the item instantaneously, and sends to Library Management System.

2.7 Return

To return an item, staff select the return function. Staff place the item on the "pad" of the station. The station captures the electronic signature and sends to the Library Management System for loan cancellation. Once confirmed, the station sets the security status of the tag and the item cannot be taken out without borrowing. The user can request for a receipt.

2.8 Sort

Sorting of items using the sorting option in counter station is a breeze. Staff select this function from the menu. Staff place an item on the "pad" and the system immediately displays on the screen, which category or compartment the item belongs to. The system literally takes away the stress and strain associated with time spent on item sorting. While the item is being scanned, the RFID tag is automatically 'armed' so that the item is ready to be returned to the shelf. Due to the seamless link with the Library Management System, the staff will be prompted immediately if there are special instructions relating to the item being sorted, e.g. the item has been reserved by a user or item belongs to other branches.

2.9 Administration Station

The Administration Station administers all stations connected onto the network.

- It monitors the status of borrowing stations, book drops and sorting stations and that of each of the readers inside the stations. It offers a bird's eye view of the complete system operations from a central location.
- It allows shut down and reset of all stations remotely from its terminals. Multiple stations can be distributed across the library floor for better workflow and circulation.
- It logs transaction counts passing through all its stations. It offers real time information of station usage as and when the information is required.

2.10 Multi-purpose Station

The Multi-purpose Station is a self-service station. It can be used as a borrowing station, item return and/or sorting station which is ideal for small private libraries with low usage and small collections of library materials.

2.11 Stock Management Solution

The Stock Management Solution (SMS) makes locating and identifying items on the shelves an easy task for librarians. It comprises basically of a portable scanner and a base station.

The system is designed to perform 3 main functions:

- Search for particular item titles.
- Inventory check of the whole library stock.
- Detect miss-shelved items according to defined categories.

3. PROBLEMS FACED BY LIBRARIES

Nowadays libraries and Information Centres are facing the following problems.

1 Rising labour costs
2 Need to improve the services for user community
3 Increased material handling time
4 Increasing theft of valuable materials (rare materials and costly materials)
5 Miss-shelved Materials
6 Poor inventory accuracy and lack of security arrangements

3.1 Application of RFID for Libraries

1 RFID tags replace the bar code (anti-theft detection) device allowing for much faster conversion of library materials in new branches.

2 RFID Station enables an easy and simple conversion of the collection from existing barcodes to RFID tags.

3 Check-out stations can be automated with easy and intuitive interfaces

4 Book returns can be automated with check-in, and systems updates completed simultaneously in the book return chute(Book drop).

5 Fast on-the-shelf inventory allows for much better accuracy in collection management. This allowslibraries to expand their collections without increasing their budgets and quickly identify the misplaced and shelf location

Table 1 Advantages of RFID over Barcode (According To "LIBSUITE RFID")

	RFID	Barcode technology
Visibility	Non Directional - does not require line of sight	Directional, requires line of sight
Range	About 40 cms	Not more than 15 cms
Multiple tags reading	Upto 200 tags per sec	About 1 or 2 per sec
Durability	Withstands harsh environments (snow, rain, sunlight), and dirty environments (dirt, dust, moisture and oil) and will last for decades	Prone to scratching and tearing
Security	Possible to detect theft on the spot	Not possible to detect theft of items

4. RFID IMPLEMENTATION AT JRD TATA MEMORIAL LIBRARY

JRD Tata Memorial Library was started in 1911 as one of the first four departments of the Institute. With the changing faces of management of libraries in India, it has ventured to bring in new technologies for library automation.

Owing to the reasons pointed out in the earlier section, the RFID hardware was procured from Tagsys Ltd. by the library [4]. The panels were fixed at the exit turnstile. Further checks were made about its feasibility using the software support provided by Libsys. It has facility for RFID tag generation based on bibliographic details. A screen shot of the same has been shown below.

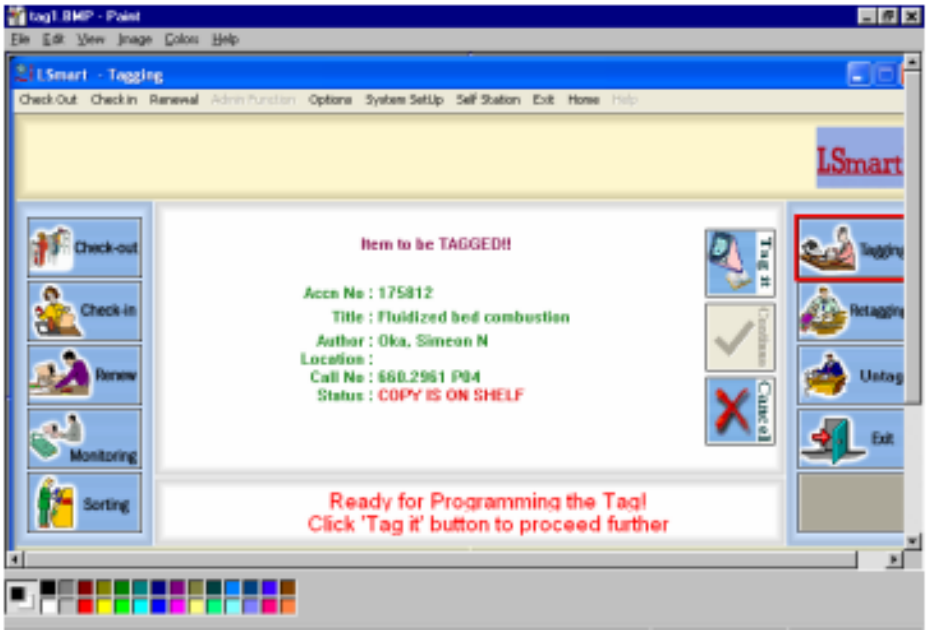


Fig. 1 RFID implementation at JRD Memorial Library

The functions carried out are tagging, check-in, check-out, retag, etc. All these functions are essential for the smooth management of the library system.

Highly used books from the circulation desk were initially tagged on a priority basis. In a parallel phase, the computer section also tagged new books processed in the cataloguing section. This brought in a degree of importance for prevention of theft of new books as well as highly used books. The staff were trained to carry out the check-in, check-out, etc. So far about 25000 books have been tagged. In spite of this, the security check cannot be reduced owing to fears of possibility of removal of the tags, etc. It is yet to implement the advanced stages of RFID tag usage - such as user dropping books in a collection box and later shelving of the books after checking.

However, as the RFID technology is very costly, small libraries cannot afford to buy it. But, large libraries can go for it to safeguard their collection to the possible extent as they are open access libraries and their collection is very valuable for research.

5. CONCLUSION

The tags that are "powerless", have a very small read range, store a minimum amount of data and carry no patron data on the tags [5]. The future of the tags will have a larger range and storage of more data on them. RFID system is a flexible technology that is convenient, easy to use and well suited for automatic operation. Patron satisfaction has become crucial for librarians. Today, many libraries are turning to RFID technology because it has proven itself in terms of security, convenience and efficiency in collection management and effective services for user community. Libraries should be benefited from an innovative and state-of-the-art system to better manage and protect their collection and increase patron satisfaction.

REFERENCES

[1] Vikas Mehta, "Radio Detection System for Information Handling", DESIDOC Bulletin Of Information Technology, Vol.24 No.4, 2004, pp. 19-23.

[2] V.Chachra and Daniel McPherson, "Personal Privacy and Use of RFID Technology in Libraries", VTLS, 2003.

[3] www.tagsys.net/rfid_in_library.html.

[4] http://www.tagsys.net/index.php? module =tagsys & func=menu&m=7&sm=1.

[5] http://www.libsuite.com/libsuite_rfid/rfid_files/Default.htm.

INTELLIGENCE ASSISTANCE FOR STUDENTS - SIDE DATA MINING

K.R.Ananthapadmanaban[1], R.Jeyshankar[2] and K.Sivasamy[3]

[1]Senior Lecturer, P.G. Department of Computer Science,SRM Arts & Science College, Chennai, Tamil Nadu

[2]Lecturer, Department of Library and Information Science, Alagappa University, Karaikudi, Tamil Nadu

[3]Assistant Librarian, SRM University, Chennai, Tamil Nadu

(Received on 31 July 2007 and accepted on 30August 2007)

Abstract

There is a large increase in the amount of educational institutions information available in web sources. This information abundance increases the complexity of locating relevant information for students to make decisions. Such a complexity drives the need for improved intelligent mining and integrating data from different web sources. This paper deals with the idea of combining the data integration, monitoring, and mining as one single process in the form of intelligence assistance for end-users (students) to make decisions for further educational purpose. This easy-to-use approach has the ability to provide interesting in-sight in data, which takes days of human effort to gather and combine manually from the web.

Index Terms: *Information retrieval, Data mining, Institutional web resources, Knowledge discovery,Data integration*

1. INTRODUCTION

The Educational institutions data imaginable can be found on the internet today: Job-related courses, faculties, lab facilities, library facilities, internet facilities, students placements, infrastructure, easy accessible location, hostel facilities, sports extra curricular activities - and statistic about events around us - just to name a few. This data, when combined and mined the right way, can give students interesting intelligence assistance for Students Side Data Mining (SSDM). In one such example where airline ticket prices can be predicted from mining ticket price data listed on major travel websites [1]. Similarly educational institutions websites on integration can give very good predictions for students to make decisions.

However, the mining process often requires extracting and integrating data from multiple web sources, monitoring to collect the data over time, and then mining the result. Such a task is often time consuming for end-users (i.e., students) to perform manually. A wide range of data mining software exists but it requires a steep learning curve, which is time consuming.

This paper presentw the idea of combining the data integration, monitoring and mining as one single process that can be done by students. The idea, the Students-Side Data Mining Assistant (SSDM), lets everyday users build information agents from multiple sources using easy-to-use operations and visualizations. The agent can also be re-executed, reconfigured with different parameters, and reused as a part of other agents.

2. OBJECTIVES

The following objectives are formulated through intelligence assistance for Students- Side Data Mining (SSDM).

1. To provide relevant integrated data.
2. To make decision to find job-oriented courses.
3. To make students identify suitable institution.
4. To save time for students in data retrieval.

3. DEFINITIONS AND MEANING

The term 'data mining' refers to the finding of relevant and useful information from databases. Data mining and knowledge discovery in the databases are a new inter disciplinary field, merging ideas from statistics, machine learning, databases and parallel computing.

Data mining, the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their data

warehouses. Data mining tools predict future trends and behaviours, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support systems.

Intelligence Assistance for Students- Side Data Mining (SSDM) tools can answer educational institutions information questions that traditionally were too time consuming to resolve. They scour databases for hidden patterns, finding predictive information that experts may miss because it lies outside their expectations.

Most companies already collect and refine massive quantities of data. Data mining techniques can be implemented rapidly on existing software and hardware platforms to enhance the value of existing information resources, and can be integrated with new products and systems as they are brought on-line. When implemented on high performance client/server or parallel processing computers, data mining tools can analyze massive databases to deliver answers to questions such as, "Which clients are most likely to respond to my next promotional mailing and why?".

4. RELATED WORKS

In the business area, existing softwares either cover some subsets of functionalities or provide an integrated solution to a specific problem. SAS (www.sas.com), the market leader in data mining tools, offers a general purpose data mining tool that allows users to monitor and mine data from traditional databases. However, the software requires extensive training before someone can use it. SPSS's Clementine offers a visual data mining tool that allows users to build a data mining plan by composing various types of nodes similar to that of Figure 1. While Clementine's visual interface provides the freedom for users to customize a plan that can be more complicated than CDMA, it also requires users to know machine learning algorithms and its language to compose expressions to derive new attributes. Furthermore, it is not clear how data monitoring might be easily configured in Clementine.

Instead of focusing on student's education, SSDM focuses on the consumer by providing an easy way to setup data monitoring and to build an expression that derives new attributes. SSDM also uses an integrated ontology to suggest users how to combine similar concepts across related attributes. Deep Analysis (www.hammertap.com) has an integrated approach similar to SSDM, but it only focuses on helping Ebay sellers analyze auctions. In the research area, provides a visual user interface for users to build wrappers, integrate information agents, and monitoring data [2]. However, Lixto does not support mining functionality but requires expert users to utilize the system. CAT guides' users through the process of building workflows but does not have the monitoring and mining capabilities [3]. Personal Choice Point [4] integrates users' preference and provides ways to visualize trade-offs, but it only address a specific problem of buying a car, while SSDM can be applied to any task depending on data sources.

5. MOTIVATING EXAMPLE

If one plans to study in India, his/her main considerations are Job-related courses, Eminent faculties, Sophisticated lab facilities, Good centralized library facilities, round the clock and Internet facilities, Student placements in reputed concerns, Infrastructure, Easy accessible locations, Hostel facilities, Sports and extra curricular activities.

The students are willing to make some factors within some reasonable limits (i.e., getting a little more expensive for efficient Institution). There are various factors that contribute course fee, but he wants to get a feel for what subject of options he can expect. Here are some questions to which one might want to know answers to narrow down his choice of which Institution to consider: (Is there any relationship between the average fees among the institutions).

The average institution rank, the average number of students placed in various MNCs. To answer those questions, one needs to be able to pull information from different institution websites, integrate different information together, and use data mining techniques to derive the answers. Figure 1 shows how data from multiple sources can be combined to be in a form that is suitable for mining. It needs to manipulate and integrate three data sources (by taking the average and joining). This integration step, if done by a person manually, could take days – not to mention the mining part to get the answers.

6. APPROACH

The example above illustrates one of a myriad of tasks where students have access to the necessary data but do not have a system that relieves them from manually manipulating the data in one simple session. It is believed that it is possible to create an integrated system that combines data integration, monitoring, and mining as one process.

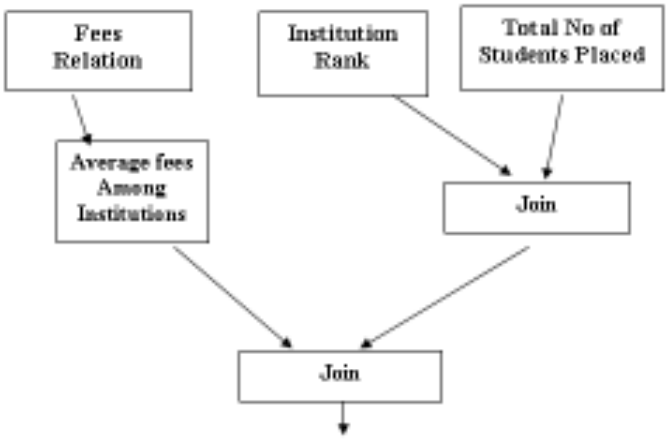


Fig. 1 The Overall Operations for the Data Integration Part of the Task.

By selecting only a necessary subset of operations, the system is simple enough for end- users to use while still allowing them to execute complex tasks. It is shown how SSDM fulfills this requirement using Steve's example as a demonstration.

SSDM can be divided into three parts. The Data Integration part retrieves and integrates data similar to what is shown in Figure 1.

The Data Monitoring allows end-users to specify how the data should be collected. The Data mining part specifies what mining operations to be performed on the data. Inspired by easy-to-use guiding steps like the Excel chart wizard, SSDM guides users through each stage by using the question-answering techniques described in our previous work on the Agent Wizard [5]. SSDM presents a user with a sequence of questions and creates an agent capable of manipulating data for the user's task based on the user's answers.

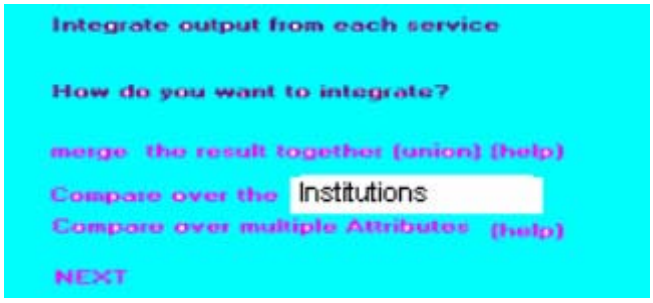


Fig. 2 Guiding Users to Join the Result for Two Data Sources Together

6.1 Data Integration

The data integration part of SSDM guides users to select which data source to use, and to transform and integrate all the data sources together as shown in Figure 1. Asking users a series questions does this. This approach is possible in the data integration phrase because it can impose a structure of how to integrate the data. At any point during the data integration phrase, it imposes limited choices, so users can only choose one of the following operations: select which data source to use, manipulate the data source (i.e., filtering and averaging an attribute), integrate two data sources together, and output the final integrated data to the next stage. For the said example, he/she would start using SSDM by selecting three different data sources (course fee data from statistic data provider, Institution ranking data from the department of education, and student placement data from the placement center). In SSDM, it provides data sources using wrappers [6]. A wrapper is a software agent that extracts data from a website. While SSDM does not focus on how to create a wrapper, Fetch Technologies (www.fetch.com) offers software that requires minimal training to build a wrapper. Wrappers differ from traditional database because these data sources can change frequently depending on websites.

After selecting the data sources, SSDM will guide the students through the process of manipulating the data (i.e. taking an average of Institution ranking), and integrating the data from different data sources together. Figure 2 shows how SSDM asks the students to join two data sources together. The output from this phrase would be an integrated table with Course, Institution ranking, Infrastructure and Placement. In case where attributes with the same meaning might have different names, users can choose "compare over multiple attributes" and specify how each attribute from each source should be joined.

6.2 Data Monitoring

This part of SSDM focuses on the case where data is dynamic (i.e., Institution ranking (IR), Student's Placement (SP)). The user will be asked when to start retrieving the data, when to stop, how often should the data be sampled (i.e., once in six month or once a year), and when to start employing the mining algorithm. An addition to the said example that involves data monitoring would be to monitor the average driving time from a particular set of cities to the place for his study through a site.

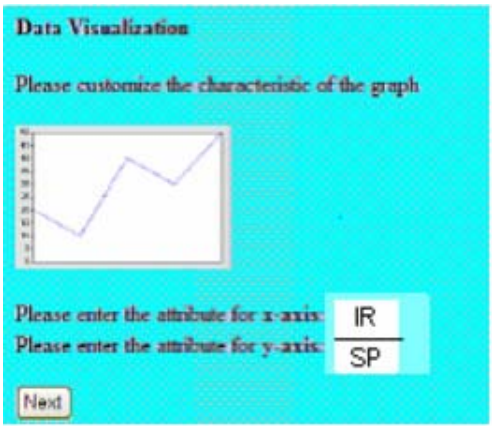


Fig. 3 Creating Graphs in SSDM

6.3 Data Mining

Data mining is the process of analyzing data from different perspectives to gain new insights relationships between attributes in data. Data Mining can become very complicated and it provides only a subset of possible operations as well as ways to visualize data that end-users understand and use. SSDM provides arithmetic operations across attributes (i.e., add, and multiply), basic statistic operations (mean, median, summation, and correlation), and ways to visualize data using graphs. SSDM would guide users through these options to transform the data into the format that would give them different perspectives. In the case where monitoring is involved, the user can also select how to be notified when the result is ready (e.g., by email). In the above case, to find out the relationships between the course fees (CF), the average Institution rankings (IR), and the placement of each Institution (SP), he might choose to create three XY graphs (IR vs. SP, SP vs. CF, and IR vs. CF). Figure 3 shows how a user can create a graph and Figure 4 shows the output graph of IR vs. CF. By viewing data in a graph instead of a table, student can see how each city fares in terms of IR and CF; there seems to be an inverse relationship between IR and CF. Student can now decide what range of the parameters would be acceptable

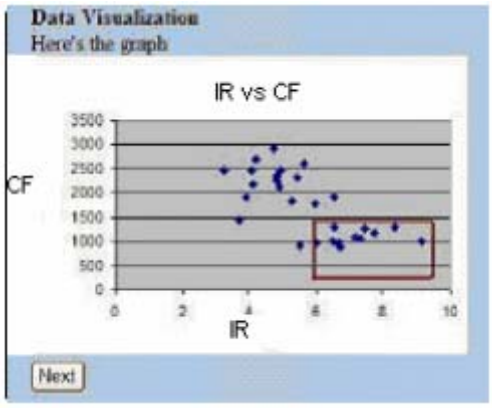


Fig 4 The output Graph for IR vs. CF (Average Institution Ranking -IR, Course Fee -CF)

6.4 Output Agent

The final output of SSDM is an agent containing parameters that specify which data sources to use, how to integrate the data together, how the data should be monitored and mined, and how to notify the user with the results. By abstracting these parameters, the resulting agent can be reused (with different parameters), reconfigured (i.e., a user might want to change how often the data is monitored), or used as a part of a new agent; the agent's output from the data integration part can also be treated a data source input when building another agent.

7. CONCLUSION

In this paper, it is found that there is untapped potential of how end-users can gain new knowledge from available data on the web. It is addressed this problem by viewing data integration, monitoring, and mining as a single process. While trading off complexity in terms of functionalities with the ease of use, it is still possible to gain interesting insights when putting different data sources together.

REFERENCES

[1] O.Etzioni, C.A.Knoblock, R.Tuchinda and A.Yates, "To Buy or Not to Buy: Mining Airline Fare Data to Minimize Ticket Purchase Price", Proceedings of the 9th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Washington, DC, 2003.

[2] R.Tuchinda and C.A.Knoblock, "Agent Wizard: Building Information Agents by Answering Questions", Proceedings of the IUI 2004, Funchal, Madeira, Portugal, January 13-16, 2004.

[3] C.A.Knoblock, K.Lerman, S.Minton and I.Muslea, "Accurately and Reliably Extracting Data from the Web: A Machine Learning Approach". IEEE Data Engineering Bulletin, Vol.23 No.4, 2000, pp. 33-41.

[4] R.Baumgartner, S.Flesca and G.Gottlob, "Visual Web Information Extraction with Lixto.", VLDB, 2001.

[5] J.Kim, M.Spraragen and Y. Gil, "An Intelligent Assistant for Interactive Workflow Composition," Proceedings of the IUI 2004, Funchal, Madeira, Portugal, January 13-16, 2004.

[6] A.Fano and S.W.Kurth, "Personal Choice Point: Helping Users Visualize What It Means to Buy a BMW", Proceeding of the IUI, January 2003.

RESOURCE SHARING AND ESTABLISHING OF LIBRARY CONSORTIUM AMONG ENGINEERING INSTITUTIONS IN TAMIL NADU: A DESIGN

S. Sivaraj[1] and Dr. S. Mohamed Esmail[2]
[1]Head, LRC, Bannari Amman Institute of Technology, Sathyamangalam, Tamil Nadu
[2]Reader, DLIS, Annamalai University, Annamalainagar, Tamil Nadu
E-mail: sivarajs123@yahoo.co.in
(Received on 01 August 2007 and accepted on 12 September 2007)

Abstract

Resource sharing in a networking system has been functioning since 1930 in developed countries while India has concentrated on interlibrary loan. Shared cataloguing, online references, shared circulation and online transmission of information are some of the services rendered by networks.

This paper discusses briefly the need of resource sharing among Engineering Institutions in Tamil Nadu with a view to justify on the basis of knowledge explosion, increased users' demands, diminished budgets, paying large amount for purchasing of books and subscribing periodicals, etc. This paper suggests that resource sharing is inevitable among the Engineering Institutions and mentions the concepts and the areas for cooperation through library consortia in the networked information environment. This paper also covers the need for setting up of Library Consortia among the Engineering Institutions in Tamil Nadu to meet the users' demand.

Index Terms: *Library consortia, Library networking, Bridging information divide*

1. INTRODUCTION

It is equally true, as well as applicable, for all types of libraries / information centers not to hold the full stock of information resources or to procure all information which may be in demand by its clientele. Even not a single library/ information center can meet the thrust of knowledge of all the readers from its stock of information, up to the fullest extent. To solve this problem, library co-operation started long ago such as library networks, ILL, document delivery, library consortium, etc which are internationally accepted, but at present the more accepted system of resource sharing is library consortium that has come into existence with a wide coverage [1].

According to Oxford English Dictionary "Consortium means temporary cooperation of a number of powers, companies, etc. for a common purpose. It is an association of similar type of organization / institution who are engaged for producing and servicing the common things / for providing services for a specific purpose of its users."

Library consortium is a "community (a cooperative) of two or more information agencies which have formally agreed to coordinate, cooperate or consolidate certain function" to achieve mutual objectives. It is an association of a group of library to achieve mutually the joint benefits. Consortia may be formed on a local, regional, national, or international basis; on a functional or format basis; or on a subject basis.

Due to low budgets, most of the libraries cannot afford to subscribe to all the important and costly serials. Library networks running consortia for its member libraries offer subscriptions to more journals at a low cost and thus help in bridging the Digital Divide fairly well [2].

2. THE SALIENT FEATURES OF LIBRARY CONSORTIA

Some of the salient features of library consortia are

1 A comprehensive collection is possible.
2 Avoidance of duplication of core collection, especially for core journals.
3 Resource sharing will reduce the cost of collection development among the participating librariea.
4 Users' demand is considered for collection development.
5 Every library is liable to send its respective holding to other libraries under resource sharing program.

6 Easy access to resource sharing on Internet by creating databases among the libraries.

Today, most of the librarians are faced with economic problems, especially in developing countries to collect all the new generated information and to satisfy the high degree of aspiration for knowledge of the users [3]. The main task of a librarian is to adjust the input resources with the desired output by adopting various alternatives for taking effective decisions and extending the services smoothly.

3. LIBRARY CONSORTIA IN INDIA

Many libraries in India till today are not in a position to afford to procure all documents and subscribe to core journals in major disciplines or CD-ROM databases, due to their financial crunch [4]. As a result, in India, library networks started with the initiatives of NISSAT in forming CALIBNET in 1986, DELNET in 1988 and other networks subsequently to promote resource sharing among libraries. The UGC (University Grants Commission, India) set up INFLIBNET in 1988.

There are many libraries in India that have setup consortia among themselves for resource sharing e.g. Astronomy libraries in India. These libraries jointly formed consortia for resource sharing amongst the libraries, such as Indian Institute of Astrophysics (IIA) Library, Inter-university Centre for Astronomy and Astrophysics (IUCAA) Library, National Centre for Radio Astrophysics (NCRA) Library, Nizamiah Observatory (NO) Library, Physical Research Laboratory (PRL) Library, Raman Research Institute (RRI) Library, Tata Institute of Fundamental Research (TIFR) Library, Uttar Pradesh State Observatory (UPSO) Library.

The Ministry of Human Resource Development (MHRD) has set up a "Consortia based subscription to Electronic Resources for Technical Education System in India" on the recommendation made by the expert group appointed by the Ministry [5]. The consortium is named as the Indian National Digital Library in Engineering Sciences and Technology (INDEST) Consortium. Many of the Educational Institutions have joined this consortium and subscribed to electronic resources at a lower cost.

The main objectives of this consortium are for better resource sharing, to reduce information costs, for speedy delivery of documents, to keep abreast of new developments, etc.

4. ENGINEERING COLLEGES IN TAMIL NADU: AN OVERVIEW

Anna University was established on 4th September 1978 as a unitary type of University. Since December 2001, it has become a large, highly renowned affiliated University, having brought into its fold about 265 Self-financing Engineering Colleges, six Government Colleges and three Government-aided Engineering colleges located in various parts of Tamil Nadu state. Now the Anna University has been alienated into Anna University, Chennai, Anna University, Coimbatore, Anna University, Trichy, and Anna University, Thirunelveli for some administration reasons. It offers higher education in Engineering, Technology, and Allied Sciences relevant to the current and projected needs of the society. Besides promoting research and disseminating knowledge gained there from, it fosters cooperation between the academic and industrial communities.

5. OBJECTIVES OF THIS STUDY

The main objectives of this study are

1 To suggest resource sharing among engineering college libraries in Tamil Nadu to ensure effective and efficient access of information.

2 To propose a design for setting up of Tamil Nadu Engineering College Libraries Consortium (TECLIBNET).

6. TECLIBNET

This study proposes a design for setting up of a consortium among Engineering College Libraries in Tamil Nadu which may be called Tamil Nadu Engineering College Libraries Network (TECLIBNET). The TECLIBNET is a computer communication network of Engineering College Libraries, proposed to improve the capability of resource sharing and information access of academic community in Tamil Nadu. It is a co-operative network and will contribute to pooling, sharing and optimization of resources, facilities, and services of engineering college libraries in the state. It also aims to develop a programme towards the modernization of engineering college libraries.

7. OBJECTIVES OF TECLIBNET

The reasons for participation in the network are minimization of duplication, providing all types of services to their users; saving of foreign exchange and overcoming financial constraints, etc.

The following objectives are proposed for the TECLIBNET.

1 To evolve a state-wide consortium of Engineering College Libraries for an optimum utilization of information resources.
2 To optimize the utilization of funds by minimizing duplication in all spheres.
3 To provide access to document collection of all the Engineering College Libraries in the state.
4 To improve the inter-library loan services among the Engineering College Libraries with smooth and speedy exchange of information through telecommunication links.
5 Standardization of library services and activities;
6 To facilitate inter-communication among the Engineering College Libraries in the state.
7 To encourage co-operation among Engineering College Libraries, Special Libraries, and Information Centers in the State.
8 To provide access to other National and International networks.

8. NETWORK COMPONENTS

In the planning of a resource sharing network, various components are to be considered. A typical set of components and their configuration for the proposed network is suggested. The resources and the infrastructure facilities presently available in Engineering College Libraries in the State and the views of the experts are also taken into consideration in suggesting the configuration.

8.1 Hardware

Considering the application areas, data volume and future growth and networking needs, the network and communication hardware for the proposed TECHLIBNET is given below.

1 Dual processor 3 Ghz server class machine
2 2 GB RAM
3 Minimum of 80 GB Hard Disk space
4 10/100 NIC (Network Interface Card)
5 Database Backup solution
6 UPS with at least 1 hour battery backup time
7 CD-RW
8 Scanner
9 Printer with network compatibility

8.2 Software

The software required for the proposed network will be as follows.

1 For the library routines like acquisition, circulation, etc.
2 For database creation and maintenance.
3 For communication interfaces.

In selecting the software there are two options.

1 To develop the software required for the system, and
2 Procure a readymade software package available in the market. There are several general and specialized software packages available in the market for library and information services. The available software may be selected after due evaluation. The software may have to be modified according to the requirements of the network. The software needs are to be compatible to the On-line network.

The requirements of the software adaptable to the networking are composite database update. Each library system will be maintaining a database of its holdings. Any new procurement in the library will require a transaction to update the local database and a similar update man be required on the composite database at the Union Catalogue. These transactions could be online or in a batch mode.

9. NETWORKING MODELS

Keeping the above considerations in mind and also taking the recommendations and counsel of the participating libraries into version, the following three models are well thought out to be more suitable for TECLIBNET.

1. Interconnecting of homepages of all Engineering College Libraries in Tamil Nadu.
2. Creating an integrated library database.
3. Establishing connectivity using search-engine architecture.

9.1 Model I

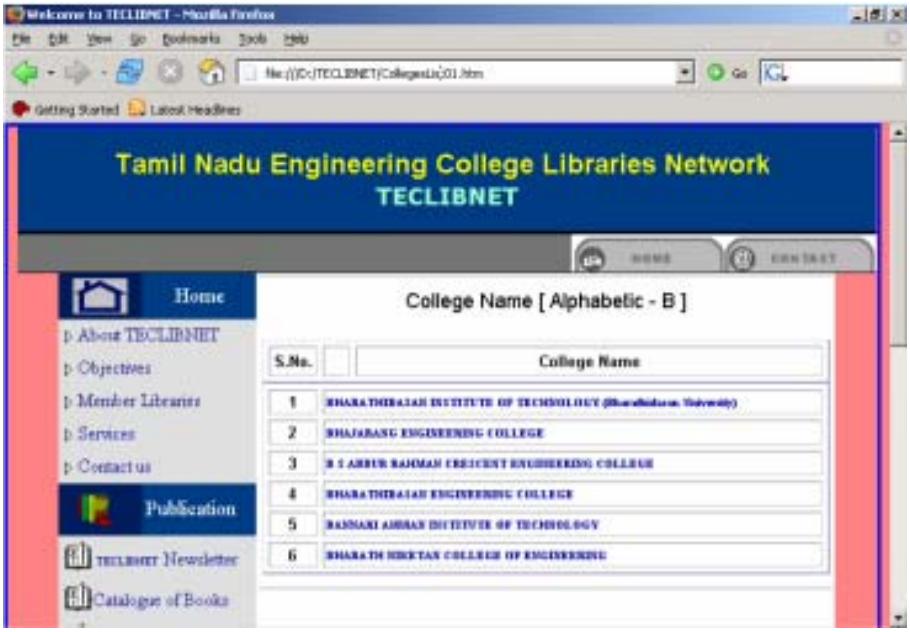


Fig. 1 TECLIBNET Linked with other College Libraries

In this simplest model, the home pages of all Engineering College Libraries in Tamil Nadu will be associated.

All Engineering Colleges in Tamil Nadu have designed their home pages and libraries are also a part of their homepages. Similarly, member libraries of TECLIBNET also have their independent web pages and they are accessible on the internet. Since these web pages will exist independently, a scientist looking for a document will be able to trace them eventually, if not immediately. At present, most of the Engineering College Libraries have internet connection, but we hope that the other Engineering College libraries, which are not having their web portal for their own, will be able to get their home pages soon.

Fig. 2 Web portal of Bannari Amman Institute of Technology Library

9.2 Model II

In this model, the databases of all individual libraries will be merged. The merging of books and journals will be effected with the help of a unique feature like the ISBN numbers. Since the physical location is one of the fields in the data entry form, it is not difficult to reflect it in the merged database. This has a major advantage from the users' point of view. It will be less time consuming, since the user will have to access only one server where the integrated database is located.

Fig.3 TECLIBNET Integrated Database

The Library softwares used in most of the libraries have the facility to display the availability status of the document. It is mandatory for the library personnel to maintain, rather than update this integrated database. It could either be a commitment from an exclusive group of people or it could be done remotely from individual locations.

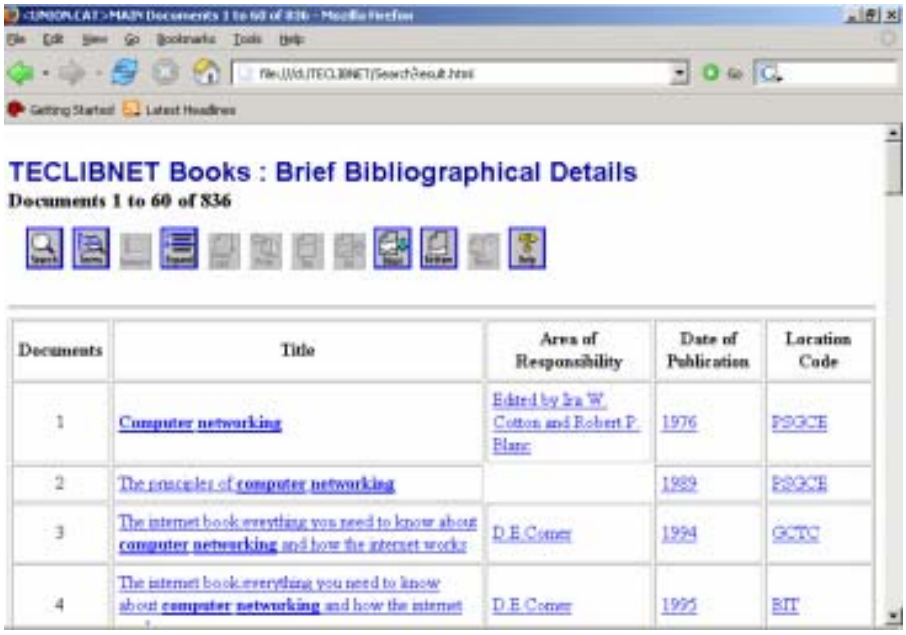


Fig.4 TECLIBNET Integrated Database Search Result

9.3 Model III

In model III, which is a complicated model, the databases will be connected with the help of search-engine architecture. By doing so, the search engine can avoid downloading all the documents from a web site which would burden the network traffic. The search engine's server takes the help of the gatherers to create a file of keywords that can be processed into an index for querying by users.

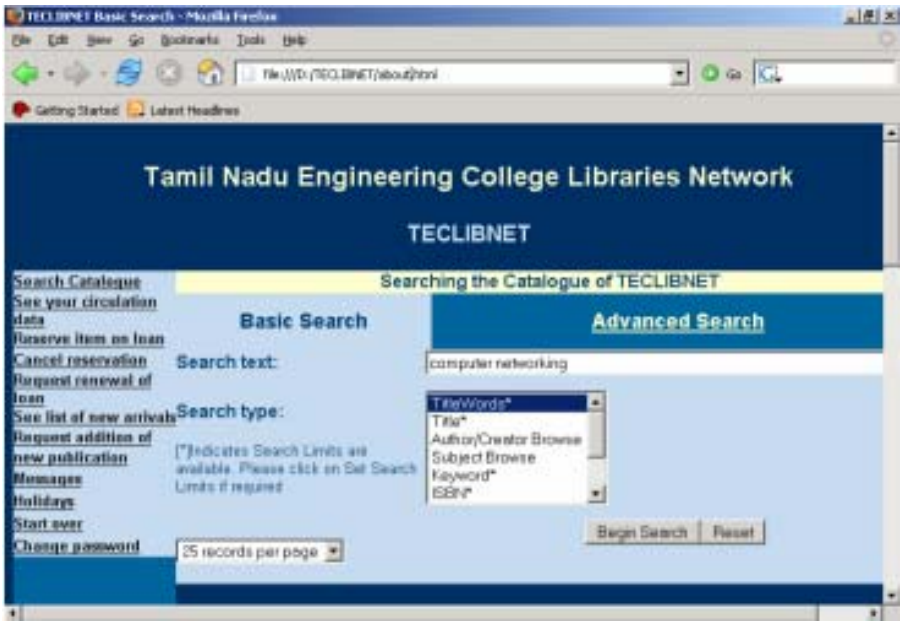


Fig.5 TECLIBNET Search Engine Architecture

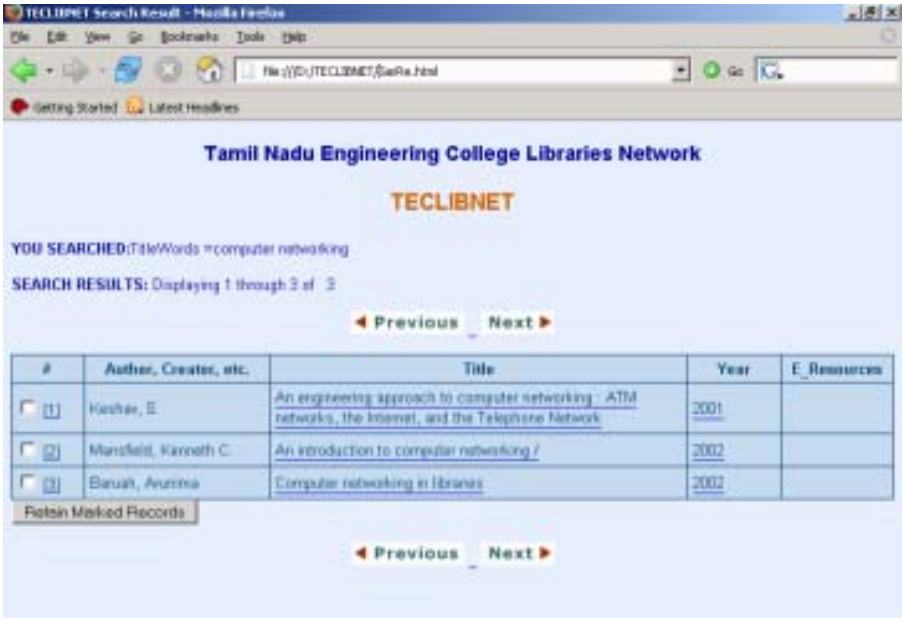


Fig.6 TECLIBNET Search Engine Architecture Search Result

10. CONCLUSION

It is absolutely necessary to share resources and pursue a wide variety of information exchange opportunities with other institutions. New breakthroughs in networking, improvements in electronic transmission of data make resource sharing a viable alternative. The library professionals must possess the ability to make effective contact with relevant people in order to share information, resources and experiences.

In the light of the above discussion, it is necessary to establish a Library Consortium among all Engineering College Libraries in Tamil Nadu for maximum utilization of resources at a reduced cost, time and space for the benefit of the students, faculty, and research scholars and in turn will improve the quality of education.

REFERENCES

[1] Kulkarni N Jagdish, "Information Technology Application in the Academic Libraries", NACLIN, 2002.

[2] Gopal Krishan, "Re-Engineering the Information Resource Management", NACLIN, 2002.

[3] Prakash Chand, G.Mahesh and V.V.Lakshmi, "Access to Electronic Journals: Archiving Issues", NACLIN, 2002.

[4] Mestri Mamata and Kumber Goudar, "E-learning and its Application in Library and Information Services", University News, vol.40 no.7, pp.13-14.

[5] Bidhan Ch. Biswas and Dasgupta K. Swapan, "Opportunities for Libraries in Managing and Resource Sharing Through Consortia: A New Challenge for Indian Librarians", Proceedings CALIBER, 2003.

IEEE TRANSACTIONS ON CONTROL SYSTEM TECHNOLOGY (1998-2006): A BIBLIOMETRIC STUDY

J.Santhi[1] and Dr.N.Murugesa Pandian[2]
[1]Librarian, Cherraan's Institute of Health Science, Coimbatore, Tamil Nadu
[2]Librarian, Ganesar College of Arts & Science, Melasivapuri, Tamil Nadu
E-mail: ganesh_me@yahoo.com
(Received on 08 August 2007 and accepted on 18 September 2007)

Abstract

In this study, a bibliometric examination of all the journal articles published in the IEEE Transactions on Control System Technology from 1998-2006 was carried out. The aim of this study is to identify country-wise, year-wise distribution, authorship pattern and ranking of authors. The study reveals that the range of articles published per volume is between 69 and 115; average number of references per article is 21; the average length per article is 10 pages; percentage of multi authored papers is slightly higher at 93.83%; most prolific author contributed 17 articles; 40% of authors are geographically affiliated to USA.

Index Terms: *Control system technology, Bibliometrics*

1. INTRODUCTION

Bibliometrics is a type of research method used in library and information science. It utilizes quantitative analysis and statistics to describe patterns of publication within a given field or body of literature [1&2]. The researchers may use bibliometric method of evaluation to determine the influence of a single writer or to describe the relationship between two or more writers or workers. The term 'Bibliometrics' implies the use of quantitative or statistical methods to study the behaviour of information. Allan Pritchard was the first man who coined the term 'Bibliometrics' in 1968 but it became more popular during 1988 [3]. According to him, it is an "application of mathematical and statistical methods to book and, other media of communication". According to D.T. Hawkins, bibliometrics is the quantitative analysis of the bibliographical features of body of literature [4]. More recently Sengupta had defined this term as the "Organization, classification and quantitative evolution of publication patterns of all macro and micro communications along their authorship by mathematical and statistical calculus". Bibliometrics offers to the information worker a type of statistical technique for the study of characteristics and attribute of literature and that of communication media.

2. OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

1 To know the overall distribution pattern of contributions
2 Distribution of reference by volume
3 Year-wise distribution of total number of pages
4 Year-wise distribution of length of articles
5 Year wise distribution of total number of contributions Vs total number of pages
6 Authorship pattern of contribution
7 Analysis of authors and their contribution
8 Country-wise distribution of authors
9 Ranked list of most prolific contributor

3 SOURCE OF JOURNAL

The IEEE, a non-profit organization, is the world's leading professional association for the advancement of technology. The full name of the IEEE is the Institute of Electrical and Electronics Engineers, Inc., although the organization is referred by the letters I-E-E-E and pronounced Eye-triple-E. The IEEE was formed in 1963 with the merger of

- The AIEE (American Institute of Electrical Engineers, formed in 1884) and
- The IRE (Institute of Radio Engineers, formed in 1912)

From its earliest origin, the IEEE has

- Advanced theory and application of electro technology and allied sciences
- Served as a catalyst for technological innovations and
- Supported the needs of its members through a wide variety of programs and services.

The mission of IEEE is to promote the engineering process of creating, developing, integrating, sharing, and applying knowledge about electro and information technologies and sciences for the benefit of humanity and profession. The volumes of IEEE Transaction on control system Technology published from 1998 - 2006 have been chosen as the source document.

4 METHODOLOGY

The data has been compiled from online journal articles. For each article following data have been noted: Name of authors, Number of authorship, Number of references, Authors geographically affiliated, Length (pages) of article [5] and other data required for the study. All the necessary information are compiled, recorded, tabulated and analysed for making observations as indicated in the objectives of the study

5. ANALYSIS AND DISCUSSION

5.1 Overall Distribution Pattern of Contributions

Table 1 Overall Distribution Pattern of Contributions

Year	Vol. No	NO.of Issues	Number of the articles/contributions						Total No. of Articles	Percentage of articles
			1	2	3	4	5	6		
1998	6	6	11	16	14	13	9	6	69	8.34
1999	7	6	14	14	10	12	13	11	74	8.95
2000	8	6	18	18	18	13	12	14	93	11.25
2001	9	6	20	22	11	14	8	6	81	9.79
2002	10	6	17	15	15	15	16	15	93	11.25
2003	11	6	19	15	13	17	15	16	95	11.5
2004	12	6	21	8	16	16	16	17	94	11.36
2005	13	6	15	16	18	20	19	25	113	13.66
2006	14	6	18	21	21	18	19	18	115	13.9
Total			**153**	**145**	**136**	**138**	**127**	**128**	**827**	**100**

Table 1 shows the total number of articles published from 1998 to 2006. On the whole, from 9 volumes and 54 issues of the journal under study, the total number of articles published is 827. The distribution of articles by volume shows that the number of articles was highest in 2006, with 115 articles. It was noted that there was a slight increase in the number of articles per volume after the first five years of publication.

5.2 Distribution of Reference by Volume

Overall distribution pattern of citation in the IEEE Transaction on Control System Technology during the period 1998-2006 contained 17,597 references in 827articles and each article has an average of 21references which has been shown in table 2.

Table 2 Distribution of Reference by Volume

S. No.	Year	Number of Pages						Total	%	Cumulative %
		1	2	3	4	5	6			
1	1998	127	179	131	132	111	57	737	8.82	8.82
2	1999	135	152	101	111	124	104	727	8.7	17.52
3	2000	198	175	207	157	124	144	1005	12.02	29.54
4	2001	216	215	127	128	90	62	838	10.03	39.57
5	2002	164	139	172	153	122	153	903	10.8	50.37
6	2003	157	122	137	177	170	174	937	11.21	61.58
7	2004	215	103	163	152	151	195	979	11.71	73.29
8	2005	166	170	162	173	165	254	1090	13.04	86.33
9	2006	177	195	197	199	189	186	1143	13.67	100
Total		**1555**	**1450**	**1397**	**1382**	**1246**	**1329**	**8359**	**100**	

5.3 Year-wise Distribution of Total Number of Pages

Table 3 Year-wise Distribution of Length of Articles

Year	No. of articles	No. of citations	Average citations per article	Cumulative	
				Reference	%
1998	69	1315	19	1315	7.5
1999	74	1373	19	1373	7.8
2000	93	2002	22	2002	11.4
2001	81	1768	22	1768	10.1
2002	93	1799	19	1799	10.2
2003	95	2075	22	2075	11.7
2004	94	2142	23	2142	12.2
2005	113	2610	23	2610	14.8
2006	115	2513	22	2513	14.3
Total	827	17597	21	17597	100

Table 3 shows the analysis of number of pages of publication is one of the most important factors in bibliometric analysis. From the table it is observed that there is an increasing trend in the quantum of publications from 2003 to 2006. From 1998 to 2002, there is a fluctuation in the publications of pages. In 2002, 2004, 2005 and 2006 all the issues cover pages above 700. The year 2006 stands in the first place in the highest value of publication pages

5.4 Year-wise Distribution of Length of Articles

Table 4 indicates the length of articles in terms of pages. Out of 827 articles, 80.41% of the articles are above seven pages in length. Only 19.59% of the articles are between 1-7 pages in length

Table 4 Year-wise Distribution of Total Number of pages

No. of Pages	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total	%
Two	1	0	0	0	0	1	0	0	0	2	0.24
Three	1	2	0	0	0	1	0	0	0	4	0.48
Four	1	1	0	0	0	1	0	1	2	6	0.73
Five	0	1	0	3	3	3	4	3	4	21	2.54
Six	4	2	3	4	8	5	10	11	8	55	6.65
Seven	2	7	5	3	10	7	6	21	13	74	8.95
> Seven	60	61	85	71	72	77	74	77	88	665	80.41
Total	69	74	93	81	93	95	94	113	115	827	100

5.5 Year-wise Distribution of Total no. of Contributions Vs Total no. of Pages

Table 5 Year-wise Distribution of Total no. of Contributions Vs Total no. of Pages

Year	Quantum of Contribution	Quantum of Total Pages	Average no. of pages per contribution
1998	69	737	11
1999	74	727	10
2000	93	1005	11
2001	81	838	10
2002	93	903	10
2003	95	937	10
2004	94	979	10
2005	113	1090	10
2006	115	1143	10
Total	827	8359	10

An attempt is made to compare the total contributions and their pages. The comparative data are presented with average in the table. It is observed from table 5 that there is a fluctuation in the number of contributions. While analyzing the average number of pages on total contribution from 1998 to 2000. It is a fluctuation trend. From 2001 to 2006 the average number of pages per contribution is 10.

5.6 Authorship Pattern of Contribution

The authorship pattern of contribution indicated that multi authored articles (93.83%) slightly outnumbered single-authored articles (6.17 %) which have been shown in table 6.

Table 6 Authorship Pattern of Contribution

Pattern	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total	%
Single	3	2	9	5	10	5	6	5	6	51	6.17
Two	33	32	31	30	34	38	29	39	45	311	37.61
Three	24	24	36	28	32	26	34	34	36	274	33.13
Four	5	11	8	13	11	17	17	23	21	126	15.24
Five & above	4	5	9	5	6	9	8	12	7	65	7.85
Total	69	74	93	81	93	95	94	113	115	827	100

5.7 Analysis of Authors and Their Contribution

Table 7 Distribution of Authors & Their Contribution

No. of Authors	No. of Contribution	%
1605	1	84.08
226	2	15.45
44	3	
25	4	
5	5	0.26
2	6	0.11
1	7	0.05
1	17	0.05
1909		100

An analysis of number of contribution given by every individual author is indicated in the table 7. The analysis by percentage indicates that relatively 84.08% (1605) of authors have contributed only one paper. 15.45% of authors have contributed 2 to 4 articles, and 0.47 of authors have contributed 5 to 7 articles.

5.8 Country–wise Distribution of Authors

Table 8 shows that out of 2350, 940 (40%) authors are geographically affiliated to USA, followed by Italy with 133 (5.7%) and Canada with 131(5.57%). 423 (18%) of authors are from Taiwan, France, U.K and Korea. The remaining 723 (30.73 %) of authors are from 48 countries

Table 8 Country-wise Distribution of Authors

S.No	Country	No.of Authors	%
1	USA	940	40
2	Italy	133	5.7
3	Canada	131	5.57
4	Taiwan	109	4.64
5	France	106	4.51
6	U.K	106	4.51
7	Korea	102	4.34
26	Other countries	723	30.73
		2350	**100**

5.9 Ranked List of Most Prolific Contributors

Table 9 shows the most prolific contributor. On the whole, a total of 2350 authors contributed 827 articles over a period of 9 years from 1998 to 2006. The most prolific authors were S. O. Reza Moheimani, who contributed 17 articles and Dennis S. Bernstein occupied the second place

who published 7 articles. Two authors contributed 6 articles each, Five authors contributed 5 articles each and 25 authors contributed 4 articles each and 44 authors contributed three articles each and 226 authors contributed 2 articles each and 1605 authors contributed one article each.

Table 9 Ranked List of Most prolific Contributor

S. No.	Author	No. of Contribution
1	S. O. Reza Moheimani,	17
2	Dennis S. Bernstein	7
3	Anna G. Stefanopoulou,	6
4	Masayoshi Tomizuka,	6
5	Marc Bodson	5
6	Rajesh Rajamani,	5
7	DongKyoung Chwa	5
8	S. N. Balakrishnan	5
9	Henk Nijmeijer,	5
10	25 authors	4
11	44 authors	3
12	226 authors	2
13	1605 authors	1

6. CONCLUSION

1 The range of articles published per volume during the period under study is between 69 and 115. Yet the increasing trend is only from 2002.The study has examined that totally 827 articles have been published for the span of 9 years.

2 The growth of total contribution is increasing from 2006 the number of contributions gets the maximum with 1143 (13.67%) pages. 1999 gets the minimum contribution as 727 (8.7%) pages.

3 The findings revealed that the average number of pages per article was 10. This value was attained in all the years of study except 1998 and 2000.

4 Out of 827 articles, 80.41% of the articles were above seven pages in length. Only 19.59% of the articles were between 1-7 pages in length.

5 The number of multi-authored papers is slightly higher at 93.83% or 776 papers out of a total of 827.

6 Out of 1909 authors who contributed a total of 827articles, 940 (40%) are geographically affiliated to USA

7 Out of 1909, 84.08 % (1605) of authors have published single paper and 15.45% (295) authors have published 2 to 4 articles and 0.16% (7) authors have published 5 to 7 articles and one author have published maximum papers of 17.

8 The most prolific author was S. O. Reza Moheimani, who contributed 17 articles and Dennis S. Bernstein occupied the second place who published 7 articles.

9 The overall journal self citation is 70.61%.This means high percentage of JSC not only enhances the impact factor of the corresponding journal but also indicates the relevance of the content of the journal to the scientific community using it.

REFERENCES

[1] J. Arora and S. Kaur, "Bibliometric: A Study Based on the Annual Review of Immunology", Annals of Library Science and Documentation, Vol. 141 No.3, 1994, pp. 84-94.

[2] K.G..Sudhir, "Output Science Research in Kerala : A Bibliometric Analysis", Annals of Library Science and Documentation, Vol. 44 No.4, 1997, pp. 113-126.

[3] Alan. Pritchard, "Statistical Bibliography or Bibliometrics", Journal of Documentation, Vol.25, 1988, pp.179-191.

[4] D.T.Howkins, "Unvocational Used of online Information Retrieval Systems: Online Bibliometric Study", Journal of American Society for Information Science, Vol. 28 No. 1, 1981,pp.13-18.

[5] W.Glänzel and U.Schoepflin, "A Bibliometric Study of Reference Literature in the Sciences and Social Sciences", Information Processing and Management, Vol. 35, 1999, pp. 31-44.

A BIBLIOMETRIC ANALYSIS ON HUMAN EYE GLAUCOMA RESEARCH PRODUCTIVITY AMONG ASIAN COUNTRIES IN PUBMED DATABASE

Dr.R.Ponnudurai[1] and R.Senthilkumar[2]
[1]Professor, Department of Library and Information Science, Annamalai University, Tamilnadu
[2]Librarian (SS), Kongunadu Arts & Science College (Autonomous), Coimbatore, Tamilnadu
E-mail: kasclibrary@yahoo.com
(Received on 10 August 2007 and accepted on 12 October 2007)

Abstract

This Bibliometric Analysis on Human Eye Glaucoma (eye disease) deals with the research productivity available in PubMed database. The publication output on glaucoma of Asian Countries is taken into consideration for this study from the year 2002 to 2006. Countrywide count, ranking, percentage & comparison with rest of the worldwide output etc., are analyzed in a detailed manner with graphs & diagrams. The volume of the article like pages of article is also analyzed in this study.

This bibliometric study focuses on the volumes of research output on glaucoma based in the pubMed database country wise, year wise of Asian countries and also compares it with the rest of the world. Many of the Asian countries have not submitted even a single article on glaucoma eye disease in PubMed database. Among the Asian countries, Japan, China, Russia, India and Oman are the leading countries contributed considerable number of research articles on glaucoma in the PubMed database.

Index Terms: *Glaucoma, Bibliometric, PubMed, Asian countries*

1. INTRODUCTION

Glaucoma is a group of diseases that can damage the eye's optic nerve and results in vision loss and blindness. Glaucoma occurs when the normal fluid pressure inside the eyes slowly rises. However, with early treatment, one can protect the eyes against serious vision loss.

Glaucoma is a condition where the intra ocular pressure of the eye is sufficiently high to cause damage to the optic nerve (which transmits the light rays to the brain). It is one of the leading causes of blindness. It is fairly common in adults over the age of 40. If diagnosed at an early stage, blindness from glaucoma can be prevented.

Glaucoma is sometimes called the silent thief because it can slowly steal eye sight before the patient realizes anything is wrong. It's a leading cause of vision loss.

The most common form of glaucoma, primary open-angle glaucoma, develops gradually, giving no warning signs. Many people aren't even aware that they have an eye problem until their vision is extensively compromised.

Glaucoma is not just one disease, but a group of them. The common feature of these diseases is damage to the optic nerve, usually accompanied by an abnormally high pressure inside our eyeball.

The optic nerve is a bundle of more than a million nerve fibers at the back of our eye. It's like an electric cable made up of thousands of individual wires carrying the images from the inside back wall of our eyeball (retina) to our brain. Blind spots develop in our visual field when the optic nerve deteriorates, usually starting with our peripheral (side) vision. If left untreated, glaucoma may lead to blindness in both eyes.

Fortunately, medical advances have made it easier to diagnose and treat glaucoma. If detected and treated early, glaucoma need not cause even moderate vision loss. But having glaucoma does mean regular monitoring and treatment for the rest of the life.

2. BIBLIOMETRICS

Bibliometry is the quantitative evaluation of scientific literature. Some of the methods serve to measure

sociological aspects of one of the researcher's most important activities-dissemination of research results in published form [1]. Bibliometrics is based on two assumptions:

1 The goal of researchers is to advance knowledge and this means disseminating the results of their research and studies through a variety of communication media, including writing, which lies at the core of the academic tradition.
2 Scholars have to publish in order to build a reputation and advance their careers.

A publication count is a means of measuring and comparing the production of various aggregates such as institutions, regions and countries. It can also be used to evaluate output in individual disciplines such as medicine, philosophy and economics, and to track trends in research fields, collaborative research and many other aspects of research output. Bibliometric study includes studies of the growth of literature in some subjects [2], how much literature is contributed by various individuals, groups, organizations or countries. How much exists in various languages, how the literature on some subjects is scattered and how quickly the literature on some subject becomes out of date. Bibliometrics is made up of methods for conducting quantitative analysis of science [3]. It can be merely descriptive (ie., counting the papers produced in a given country, in a given institution or in a given discipline) or it can be related to population or economic indicators.

3. DATA COLLECTION

The data were collected from PubMed database using Medline format (indexing) through Internet. The data collected are maintained in a proper order in the database. The research output published from the year 2002-2006 was collected for this study.

4. PUBMED

PubMed, available via the NCBI Entrez retrieves system, was developed by the National Centre for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) located at the U.S. National Institutes of Health (NIH). Entrez is the text based search and retrieval system used at NCBI. PubMed provides access to citations from biomedical literature. Publishers participating in PubMed submit their citations electronically to NCBI prior to or at the time of publication [4]. If the publisher has a website that offers full-text of its journals [5], PubMed provides links to that site as well as biological resources, consumer health information, research tools and many more. PubMed provides access to bibliographic information that includes MEDLINE, OLDMEDLINE, etc.

5. ANALYSIS AND INTERPRETATION

In this study, by using the collected data, the following four topics are analyzed:

1 Analysis of comparison of Asian Countries research output with the rest of the world research output of glaucoma in PubMed.
2 Countrywide research output and its percentage analysis.
3 Rank analysis of countrywide research output of glaucoma.
4 Analysis of volume of articles.

5.1 Publication of Human Eye Glaucoma Reseach Output

Table 1 Publication of Human Eye Glaucoma Research Output

Year	Asian Countries		Rest of the world		Total no of Outputs
	No of Outputs	%	No of outputs	%	
2002	45	7%	635	93%	680
2003	66	10%	646	90%	712
2004	71	10%	657	90%	728
2005	53	7%	712	93%	765
2006	43	8%	540	92%	583
Total	278	9%	3190	91%	3468

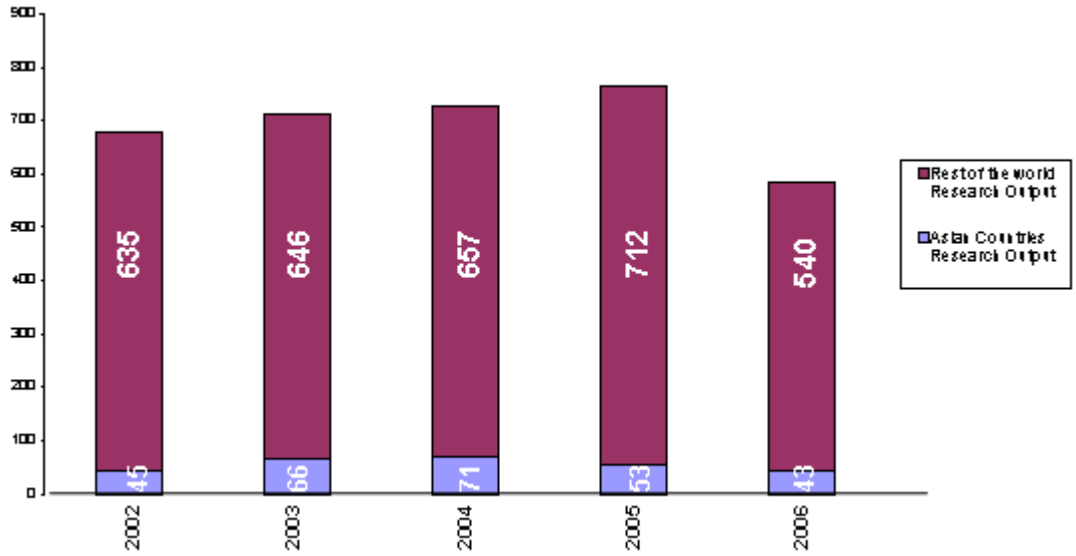


Fig.1 Comparison of Human Eye Glaucoma Research Out put among Asian Countries and Other Countries (2002-2006)

Table 1 shows that only 9% of the research output by the Asian countries are available in PubMed database. 91% of the research outputs are published by other than Asian countries. In the year 2006, the research output was less, compared with the years 2002 onwards. Only 583 articles were published in 2006 out of 3468 articles from 2002 to 2006. The highest worldwide output was in the year 2005 in PubMed ie 765 (93%) articles. But the contributions of Asian Countries were only 53 (7%) in 2005.

5.2 Country-wise Research Output Percentage on Human Eye Glaucoma

Table 2 Country-wise Research Output Percentage on Human Eye Glaucoma

Country	No of Article	Percentage
China	60	21.5%
India	35	12.5%
Israel	5	2%
Japan	88	32%
Malaysia	3	1%
Nepal	1	0.4%
Oman	23	8%
Pakistan	3	1%
Russia	50	18%
Saudi Arabia	1	0.4%
Singapore	2	0.7%
Thailand	7	2.5%
Total	278	100%

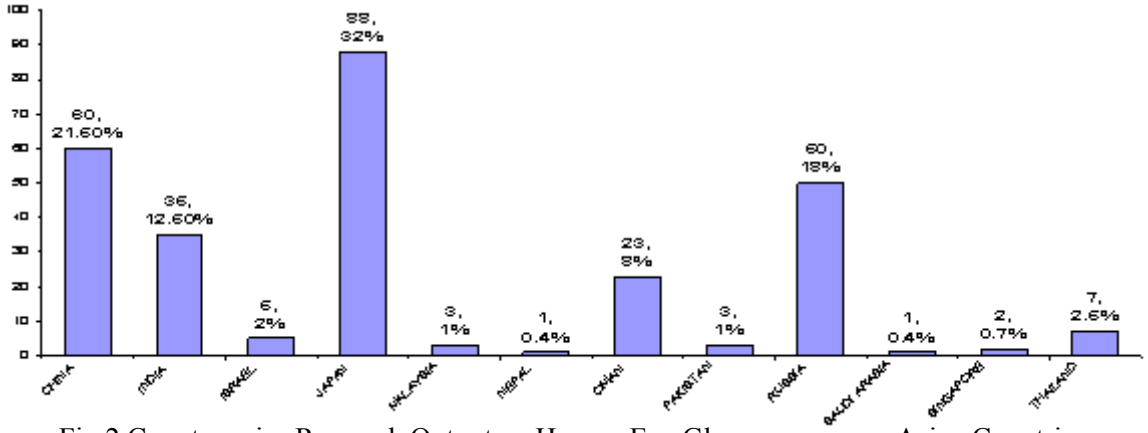


Fig.2 Country-wise Research Output on Human Eye Glaucoma among Asian Countries

Table 2 shows the country wise (Asian countries) research output of glaucoma in PubMed database and its percentage. Totally 278 articles were published by the Asian countries from 2002-2006. Japan alone published 88 articles ie. 32% among the Asian countries and China was followed by 60 articles (21.5%) then Russia got 3rd place by 50 articles (18%). India was in 4th place by 35 articles (12.5%).

Among the glaucoma research published countries in Asia, Nepal & Saudi Arabia published each one article in PubMed from 2002 to 2006, many countries like Afghanistan, Armenia, Bangladesh, Turkey etc., did not publish even a single article on glaucoma in PubMed from 2002 to 2006. Only 12 countries among 53 countries published research article on glaucoma in PubMed.

Table 3 Country-wise Ranks of Research output on Human Eye Glaucoma (2002-2006)

Country	No of Articles	Rank
Japan	88	1
China	60	2
Russia	50	3
India	35	4
Oman	23	5
Thailand	7	6
Israel	5	7
Pakistan	3	8
Malaysia	3	8
Singapore	2	9
Saudi Arabia	1	10
Nepal	1	10

5.3 Country-wise Ranks of Research Output on Human Eye Glaucoma

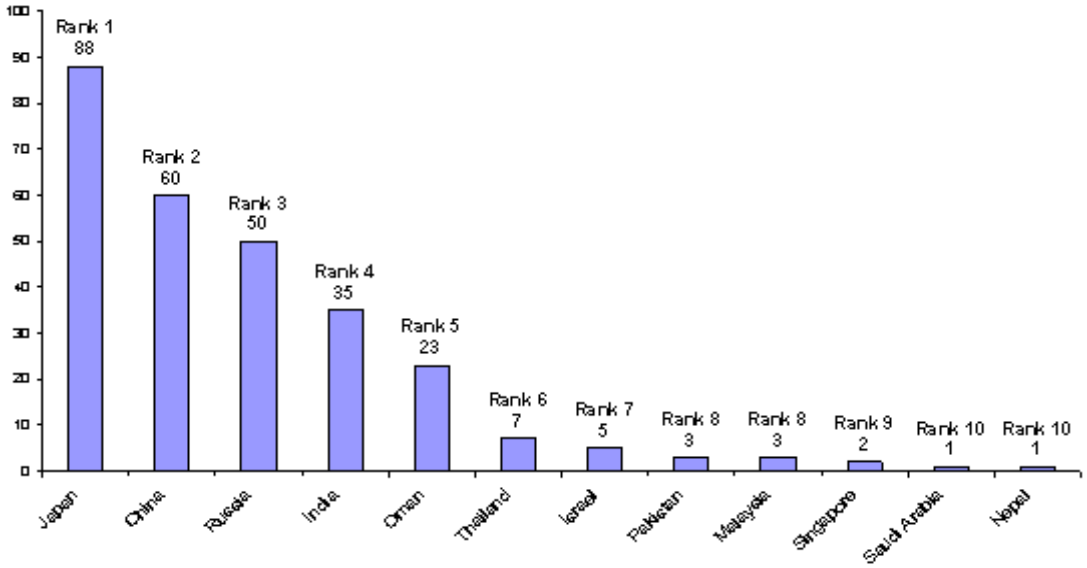


Fig.3 Country-wise Research Output Rank on Human Eye Glaucoma among Asian Countries

From table 3, Japan got first rank followed by China (2nd rank), Russia (3rd Rank), India (4th Rank), Oman (5th Rank),.. Nepal & Saudi Arabia got 10th Rank among Asia towards publication of research articles on Glaucoma from 2002 to 2006.

5.4 Country-wise Analysis of Research Output on Glaucoma in Pubmed from 2002-2006

Table 4 Country-wise Analysis of Research output on Glaucoma in Pubmed from 2002-2006

S No	Country	No of Articles	No. of Pages
1	Afghanistan	-	-
2	Armenia	-	-
3	Azerbaijan	-	-
4	Bahrain	-	-
5	Bangladesh	-	-
6	Bhutan	-	-
7	Brunei	-	-
8	Cambodia	-	-
9	China	60	326
10	Cyprus	-	-
11	Gaza	-	-
12	Georgia	-	-
13	Hong Kong	-	-
14	India	35	144
15	Indonesia	-	-
16	Iran	-	-
17	Iraq	-	-
18	Israel	5	49
19	Japan	88	509
20	Jordan	-	-
21	Kazakhstan	-	-
22	Kuwait	-	-
23	Kyrgyzstan	-	-
24	Laos	-	-
25	Lebanon	-	-
26	Macau (Prc)	-	-
27	Malaysia	3	17
28	Maldives	-	-
32	North Korea	-	-
33	Oman	23	121
34	Pakistan	3	12
35	Philippines	-	-
36	Qatar	-	-
37	Republic Of China (Taiwan)	-	-
38	Russia	50	189
39	Saudi Arabia	1	4
40	Singapore	2	10
41	South Korea	-	-
42	Sri Lanka	-	-
43	Syria	-	-
44	Tajikistan	-	-
45	Thailand	7	42
46	Timor-Leste (East Timor)	-	-
47	Turkey	-	-
48	Turkmenistan	-	-
49	United Arab Emirates	-	-
50	Uzbekistan	-	-
51	Vietnam	-	-
52	West Bank	-	-
53	Yemen	-	-
Total		278	1425

From table 4, it was observed that Japan published 88 articles with the number of pages of 509. China published 60 articles, the pages were only 326. Totally 278 articles with 1425 pages were published by the Asian countries. The average page per article was 5.12.

6. CONCLUSION

Based on this study, Asian countries are far behind in the research on glaucoma compared with the rest of the world. Only 10% and below is the contribution of the Asian countries in the research productivity on glaucoma based in the pubMed database. Many of the Asian countries have not submitted even a single article on glaucoma eye disease in pubMed database. Japan, China, Russia, India and Oman are the leading countries contributing considerable number of research articles in the PubMed database among the Asian countries.

REFERENCES

[1] G.Devarajan, "Bibliometric Studies", Ess Ess Publications, New Delhi, 1997.

[2] Ashwini Tiwari, "Bibliometrics Informetrics and Scientometrics: Opening New Vistas of Information Science", RBSA Publishers, Jaipur, 2006.

[3] G. Devarajan, "Applied Research in Library and Information Science", Ess Ess Publications, New Delhi, 2005.

A SCIENTOMETRIC MAPPING OF RESEARCH PERFORMANCE ON NANOTECHNOLOGY: THE INDIAN PERSPECTIVE

Dr. P. Sivaraman[1], S. Sivaraj[2] and M. Surulinathi[3]
[1]Reader, Annamalai University, Annamalainagar, Tamilnadu
[2]Head, Learning Resource Centre, Bannari Amman Institute of Technology, Tamil Nadu
[3]Ph.D. Scholar, Annamalai University, Annamalainagar, Tamilnadu
E-mail: surulinathi@gmail.com
(Received on 11 August 2007 and accepted on 15 October 2007)

Abstract

This research work attempts to analyze quantitatively the growth and development of Nanotechnology Research in India in terms of publication output as reflected in Web of Science Database (SCI) for the period 1998 to 2006. The researchers have published a total of 79 papers on Nanotechnology during this period. The study reveals that Nanotechnology research in India is still in its infancy.

Index Terms: *Nanotechnology, Scientometric mapping*

1. INTRODUCTION

Scientometric mapping describes the output traits in terms of organizational research structure, resource inputs and outputs, develops benchmark to evaluate the quality of information output. Scientometric studies characterize the disciplines using the growth pattern and other attributes [1]. These studies have potential particularly in assessing the emerging disciplines. Thus, Scientometric study of research performance of Nanotechnology has potential and enables the users to get an understanding the structure of it.

Nanotechnology refers broadly to a field of Applied Science and Technology whose unifying theme is the control of matter on the atomic and molecular level in scales smaller than 1 micrometre, normally 1 to 100 nanometers, and the fabrication of devices within that size range. It is a highly multidisciplinary field, drawing from fields such as Applied Physics, Materials Science, Colloidal Science, Device Physics, Supramolecular Chemistry, and even Mechanical and Electrical Engineering [2]. Much speculation exists as to what new science and technology may result from these lines of research. Nanotechnology can be seen as an extension of existing sciences into the nanoscale, or as a recasting of existing sciences using a newer, more modern term.

2. SCOPE OF THE STUDY

The present study attempts to find out the publication pattern of researchers of Nanotechnology. This study is based on the references and aims to analyze quantitatively the growth and development of Nanotechnology in India in terms of publication output as reflected in Web of Science Database during 1998-2006 [3]. Web of Science is the largest abstract and citation database of research literature and quality web-only journals. It is designed to enable not only the researchers for accessing scientific information but also provide the information scientists to study the literature for different information analyses purposes, quick, easy, and comprehensive. Web of Science provides superior support of the literature research process.

3. OBJECTIVES

The main objective of the study is to present the growth of literature and make the quantitative assessment of status of researchers of Nanotechnology in India by analyzing the various features. The specific objectives are

1 To measure year-wise growth of publications in terms of input of records
2 To measure domain-wise contributions
3 To measure authorship pattern in the publications
4 To measure source of publications
5 To measure format of publications

4. METHODOLOGY

The study entitled "Scientometric Mapping of Research Performance on Nanotechnology: The Indian Perspective" is a case study encompassing records output on Web of Science (SCI) [4]. The present study aims at analysing the research output of India in the field of Nanotechnology. The growth rates of output in terms of both at absolute level and relative level are analysed from 1998 to 2006. The authorship pattern and the author productivity are examined to identify the pattern of research contribution in the field of Nanotechnology [5]. The area-wise research performance is analysed to identify the emerging area of research. The study is mainly exploratory in nature in identifying research output of Indian Nanotechnology researchers.

5. RESULTS AND DISCUSSION

5.1 Year-wise Distribution of Research Output

Nanotechnology research output of National level is mainly mentioned in the table 1. The table given below indicates the total output made by the Indian researcher during 1998-2006. The number of publication is accounted to 1 in 1998 and it was raised upto 26 in 2006. The publication output in 2006 was noted to be the highest productivity of 32.91 per cent output over the study period. From the discussion, it could be deduced that there was a gradual growth trend noted in terms of publication output made by the Indian researchers. In the present study, the total output has been observed to 79 for 9 years and no research output in 1999 and 2000.

Table 1 Year-wise Distribution of Indian Researchers on Nanotechnology

Publication Year	Research Output	Percentage	Cumulative %
2006	26	32.91	32.91
2005	19	24.05	56.96
2003	13	16.45	73.41
2004	10	12.66	86.07
2002	8	10.13	96.20
2001	2	2.53	98.73
1998	1	1.27	100.00
Total	**79**	**100.00**	

5.2 Institution-wise Nanotechnology Research Output

Table 2 indicates Institution-wise Nanotechnology research productivity. It is noted that Indian Institute of Technology and National Chemical Laboratory ranks first in order by contributing 15.19 per cent of total research output. Indian Institute of Technology and National Chemical Laboratory have well established infrastructure facility. The second place in order is recorded by Indian Institute of Science, Bangalore also having well established infrastructure facility which shares 10.13 per cent, Saha Institute of Nuclear Physics contributing 5.06 per cent of total scientific research output of the specified institution takes third place in order. The other 58 Institutions have given less than 5 per cent of share in total research output.

Table 2 Institutions-wise Research Output

Institution Name	Record Count	% of 79
Indian Institute of Technology	12	15.19
National Chemical Lab	12	15.19
Indian institute of Science	8	10.13
Saha institute of Nuclear physics	4	5.06
Bhabha Atom Research Centre	3	3.80
Cent elect Engineering research institute	3	3.80
Tohoku University	3	3.80
Caltech	2	2.53
CSIR	2	2.53
Government India	2	2.53
Indian Assoc Cultivation Science	2	2.53
Int inst information technology	2	2.53

Institution Name	Record Count	% of 79
Jawaharlal Nehru Ctr adv Science Research	2	2.53
University Hyderabad	2	2.53
Abasaheb Garware college	1	1.27
Alagappa University	1	1.27
All India Inst Med Science	1	1.27
Armed forces med college	1	1.27
Asian Institute of technology	1	1.27
Banaras Hindu University	1	1.27
BARC	1	1.27
Bharati vidhyapeeths College Engn Womens	1	1.27
Cent Electrochem Research Institute	1	1.27
Cent glass & Ceram Res inst	1	1.27
Cent sci instrument org	1	1.27
Ctr mat elect technology	1	1.27
Def inst adv technology	1	1.27
Ganpat University	1	1.27
Georgia inst technology	1	1.27
Govt higher secondary scheme	1	1.27
Guru Gobind Singh Indraprastha University	1	1.27
Indian petrochem corp Ltd	1	1.27
Indian sch mines	1	1.27
IGCAR	1	1.27
Inst life science	1	1.27
Inst phys	1	1.27
Inst Theoret & Angew phys	1	1.27
Ja College women	1	1.27
Jai Narain Vyas University	1	1.27
Japan Science & Technology agcy	1	1.27
Karunya Inst technology & Science	1	1.27
Kurukshetra University	1	1.27
Madurai Kamaraj University	1	1.27
Maharaja Sayajirao University Baroda	1	1.27
Max Planck inst met Research	1	1.27
National phys lab	1	1.27
Niper	1	1.27
Nmssvn College	1	1.27
Postgrad Inst Med Educ & Research	1	1.27
PT Ravishankar Shuklar	1	1.27
PZT Ctr	1	1.27
Raja Rammohun Roy Mahavidyalaya	1	1.27
Shivaji University	1	1.27
Sree Chitra Tirunal inst med Science & technology	1	1.27
Tech University Clausthal	1	1.27
University Arkansas	1	1.27

University Aveiro	1	1.27
University British Columbia	1	1.27
University Illinois	1	1.27
University Potsdam	1	1.27
University Stuttgart	1	1.27
Vishwakarma Institute of technology	1	1.27

5.3 Author-wise Distribution of Research Output

The objective of the study of authorship pattern is to bring out the research pattern in a discipline. The extent of research contribution by the Indian researchers is explained in the analysis of authorship pattern. It is well known that nowadays research is carried out by group of researchers rather than by a single researcher. The total contributions published by Indian researchers are calculated to 79 over the study period.

It could be noted that two authored papers rank first in the order sharing 29.11 per cent of the total research output. The one-authored papers follow the second in the order taking 24.05 per cent of the total research contributions. The three-authored contributions take the third in the order sharing 16.46 per cent of the total scientific research output during the study period. Four authored papers rank next in the order reporting 8 contributions results in 10.13 per cent of total Nanotechnology research output.

Table 3 Author-wise Distribution of Research output

No of Authors	No of Contribution	Percentage	Cumulative %
1	19	24.05	24.05
2	23	29.11	53.16
3	13	16.46	69.62
4	8	10.13	79.75
5	5	6.33	86.08
6	4	5.06	91.14
7	5	6.33	97.47
8 and Above	2	2.53	**100.00**
Total	**79**	**100.00**	

5.4 Country-wise Collaborative Distribution of Research Output

During 1998–2006, India produced a total no.of 79 publications.

Table 4 Country-wise Collaborative Research output

Country/Territory	Record Count	% of 79
India	79	100.00
USA	5	6.33
Germany	3	3.80
Japan	3	3.80
Canada	1	1.27
Portugal	1	1.27
Thailand	1	1.27

More than 5 (6.33%) collaboration with USA, 3 (3.80%) collaboration each with Germany and Japan, 1(1.27%) collaboration each with Canada, Portugal, and Thailand respectively. It is well known that nowadays research is carried out by group of researchers rather than by a single researcher.

5.5 Document Type-wise Distribution

During 1998–2006 India produced a total no.of 79 publications. The highest numbers of publications were 67 (84.81%) Journal articles, 7 (8.86%) Reviews, 4(5.06%) Editorial Materials and 1 (1.27%) Letter.

Table 5 Document-wise Research output

Document Type	Record Count	% of 79
Article	67	84.81
Review	7	8.86
Editorial Material	4	5.06
LETTER	1	1.27
Total	**79**	**100.00**

5.6 Subject Domain-wise Distribution

During 1998–2006 India produced a total no.of 79 publications which have contributed significantly to the following main domains broadly grouped as:

- Materials Science, Multidisciplinary
- Physics, Applied
- Chemistry, Multidisciplinary
- Chemistry, Physical
- Multidisciplinary Sciences
- Nanoscience & Nanotechnology
- Physics, Condensed Matter
- Chemistry, Inorganic & Nuclear
- Engineering, Multidisciplinary
- Pharmacology & Pharmacy
- Physics, Multidisciplinary
- Biochemistry & Molecular Biology
- Biophysics
- Biotechnology & Applied Microbiology
- Crystallography
- Materials Science, Biomaterials
- Materials Science, Coatings & Films
- Computer Science, Theory & Methods
- Engineering, Chemical
- Engineering, Electrical & Electronic
- Engineering, Industrial
- Physics, Atomic, Molecular & Chemical
- Polymer Science
- Telecommunications

There were 16 (20.25%) publications in Materials Science domain followed by 15 (18.99%) in Applied Physics, 13(16.46%) publications in Chemistry, 12 (15.19%) publications in Physical Chemistry and Multidisciplinary Sciences, 10 (12.66%) Publications in Nanoscience & Nanotechnology and others less than 5 in different disciplines and growth of publications in each domain is given below.

Table 6 Subject-wise Research Output

Subject Category	Record Count	% of 79
Materials Science, Multidisciplinary	16	20.25
Applied Physics	15	18.99
Multidisciplinary Chemistry	13	16.46
Physical Chemistry	12	15.19
Multidisciplinary Sciences	12	15.19
Nanoscience & Nanotechnology	10	12.66
Physics, Condensed Matter	10	12.66
Inorganic & Nuclear Chemistry	4	5.06
Engineering, Multidisciplinary	4	5.06
Pharmacology & Pharmacy	4	5.06
Physics, Multidisciplinary	4	5.06
Biochemistry & Molecular biology	3	3.80
Biophysics	3	3.80
Biotechnology & Applied Microbiology	3	3.80
Crystallography	3	3.80
Materials Science, Biomaterials	3	3.80
Materials Science, Coatings & Films	3	3.80
Computer Science, Theory & Methods	2	2.53
Engineering, Chemical	2	2.53
Engineering, Electrical & Electronic	2	2.53
Engineering, Industrial	2	2.53
Physics, Atomic, Molecular & Chemical	2	2.53
Polymer Science	2	2.53
Telecommunications	2	2.53
Chemistry, Analytical	1	1.27
Chemistry, Applied	1	1.27
Chemistry, Organic	1	1.27
Engineering, Biomedical	1	1.27
Food science & Technology	1	1.27
Management	1	1.27
Medicine, General & Internal	1	1.27
Operations Research & Management Science	1	1.27
Physics, Fluids & Plasmas	1	1.27
Physics, Mathematical	1	1.27
Physics, Nuclear	1	1.27
Total	**79**	**100.00**

5.7 Source-wise Distribution of Research Output

During 1998–2006, India has produced a total no.of 79 publications in the field of Nanotechnology. More than 67(84.81%) papers were published on only the specific area of Nanotechnology. The highest number of publications were 7(8.86%) on Current Science and 4(5.06%) followed by Synthesis and Reactivity in Inorganic Metal-Organic. Nano-Metal Chemistry and other journals having less than 3 publications.

Table 7 Source-wise Research Output

Source Title	Record Count	% of 79
Current Science	7	8.86
Synthesis and reactivity in inorganic metal-organic and Nano-metal Chemistry	4	5.06
Journal of Nanoscience and Nanotechnology	3	3.80
Pramana-Journal of Physics	3	3.80
Advances in Computer Systems Architecture, Proceedings	2	2.53
Chemistry-A European Journal	2	2.53
Colloids and surfaces B-Biointerfaces	2	2.53
Current Applied Physics	2	2.53
IETE Technical Review	2	2.53
Indian Journal of Engineering and Materials Sciences	2	2.53
Journal of Applied Physics	2	2.53
Journal of Computational and Theoretical Nanoscience	2	2.53
National Academy Science Letters-India	2	2.53
Proceedings of the Indian academy of sciences-chemical sciences	2	2.53
Thin Solid Films	2	2.53
Angewandte Chemie-International Edition	1	1.27
Applied Surface Science	1	1.27
Biological & Pharmaceutical Bulletin	1	1.27
Biomacromolecules	1	1.27
Biophysical Journal	1	1.27
Biotechnology Progress	1	1.27
Bulletin of Materials Science	1	1.27
Catalysis Today	1	1.27
Chemical Physics Letters	1	1.27
Chemistry of Materials	1	1.27
Clinical Pharmacokinetics	1	1.27
Critical Reviews in Biotechnology	1	1.27
Crystal Growth & Design	1	1.27
Crystengcomm	1	1.27
Defence Science Journal	1	1.27
European Physical Journal-Applied Physics	1	1.27
Hyperfine Interactions	1	1.27
Indian Journal of Physics and Proceedings of the Indian Association for the Cultivation of Science-Part A	1	1.27
International Journal of Pharmaceutics	1	1.27
Journal of Applied Polymer Science	1	1.27

Journal of Biomedical Materials Research part B-applied Biomaterials	1	1.27
Journal of Drug Targeting	1	1.27
Journal of Materials Chemistry	1	1.27
Journal of Molecular Structure	1	1.27
Journal of Photochemistry and Photobiology A-Chemistry	1	1.27
Journal of Physical Chemistry B	1	1.27
Journal of Physics D-Applied Physics	1	1.27
Journal of Scientific & Industrial Research	1	1.27
Langmuir	1	1.27
Molecular Crystals and Liquid Crystals	1	1.27
Nanotechnology	1	1.27
National Medical Journal of India	1	1.27
Nucleic Acids Research	1	1.27
Physical Review B	1	1.27
Physical Review E	1	1.27
Process Biochemistry	1	1.27
Pure and Applied Chemistry	1	1.27
Sadhana-Academy Proceedings in Engineering Sciences	1	1.27
Technovation	1	1.27
Thermochimica Acta	1	1.27
Total	**79**	**100.00**

6. CONCLUSION

This paper has highlighted quantitatively the contributions made by the Indian Nanotechnology researchers during 1998-2006 as reflected in the Web of Science Database. During 1998 – 2006, Indian contributions in terms of number of publications are not significant. A comparison of Indian output in relation to the world output (India 79 and International 3928) may help in understanding the contribution in a better angle. Though the records available in the Web of Science Database reveal a small number, it is important that the Web of Science covers only the peer-reviewed journals. If a broader coverage database is available, it may provide a reasonable number of papers. It is suggested for tracking citation record of papers so that the impact of publications in Nanotechnology may be visible.

REFERENCES

[1] M. Surulinathi, M. Nagarajan, P. Sivaraman and Titiksha Goswami, "Scientometric Dimensions of Knowledge Management Research in India: A Study based on Scopus Database", Paper Presented at International Conference on Future of Knowledge Organization in the Networked Environment, DRTC, Bangalore, 3-4 September, 2007, pp.469-475.

[2] B. S. Kademani, Vijai Kumar, Anil Sagar and Anil Kumar. "Scientometric Dimensions of Nuclear Science and Technology Research In India: A Study based on INIS (1970-2002) Database", Malaysian Journal of Library & Information Science, Vol. 11 No.1, 2002, pp. 23-48.

[3] http://eprints.rclis.org/archive/00007485/01/INIS_MJLIS_Final_18_10_2006.pdf

[4] http://isiknowledge.com

[5] http://en.wikipedia.org/wiki/Nanotechnology