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INFORMATION RESEARCH: AN INTERNATIONAL ELECTRONIC JOURNAL: A BIBLIOMETRIC STUDY

BHUPENDRA RATHA
Lecturer
Central Library, Devi Ahilya University, Indore (M.P.).
E-Mail Id: bhu261@gmail.com

DR. G.H.S. NAIDU
Librarian,
Central Library, Devi Ahilya University, Indore (M.P.).
E-Mail Id: ghsnaidu@gmail.com

MANISHA GAWDE
Assistant Librarian
Mathura Devi Institute of Technology and Management, Indore (M.P.).
E-Mail Id: gawde.manisha881@gmail.com

Abstract

At present bibliometric study is an interacting research topic in the field of library and information science. Library and information science professionals are doing bibliometric study in various fields for the collection development of different subject in their libraries. This paper examines that the Bibliometric Analysis of the Information Research: an International Electronic Journal (IRIEJ). Which is included the study of form of documents, authorship pattern, ranking of authors, year wise distribution of references and articles, ranking of cited journals, cited publishers and research contributors of IRIEJ.

Keywords: Bibliometric, e-journal, OAJ, IRIEJ, EJISDC.

1. Introduction:

The presents study is interact to the bibliometric study of the Information Research: an International Electronic Journal (A Quarterly Journal) which is an Open Access Journals (OAJ) of library and information science and It is published by Professor T. D. Wilson, Professor Emeritus of the University of Sheffield, with in kind support from Lund University Libraries, Lund, Sweden and from the Swedish school of library and information science. The biblometric study of Information Research: an International Electronic Journal has been already done by the Dr. Jagtar Singh and HPS Kalra (200)[1]. Their study was comparative analysis of the basic bibliometric data of two international electronic journals in LIS namely the "Electronic Journal of Information Systems in Developing Countries (EJISDC)" and "Information Research: An International Electronic Journal (IRIEJ). Their study was limited to 2000-2004.The present study is some different to their study that included only five volumes of IRIEJ from 2007-2011.

2. Related studies:

Tsay, Ming-yueh (2011)[2] this study explored and compared the bibliometric characteristics and the subject relationship with other disciplines of and among the three leading information science journals JASIST, IPM and JOD. Sin, Sei-Ching Joanna

(2011)[3] this study analyzed 7,489 papers published in six leading publications (ARIST, IP&M, JAMIA, JASIST, MISQ, and Scientometrics) over the last three decades. Hussain, Akhtar, Fatima, Nishat, Kumar, Devendra (2011)[4] The paper analyzed a bibliometric study of 578 articles were published during the period January 1, 2000 to December 31, 2010 in the *Electronic Library* journal. Mittal, Rekha; Sharma, Arti; Singh, Gian (2006)[5] the study analyzed 536 papers published on the library and information science education during the period of 1995 to 2004.

3. Objective of the Study:

The following are the objectives for the present study;

3.1. To know the various forms of information sources, used by contributors in article.
3.2. To know the authorship pattern in the references of articles.
3.3. To know the ranking of cited authors.
3.4. To study year-wise distribution of references.
3.5. To study year-wise distribution of articles and papers.
3.6. To know the ranking of cited journals.
3.7. To know the ranking of cited publishers.
3.8. To know the ranking of research contributors for IRIEJ.
3.9. To study subject-wise distribution of the papers.

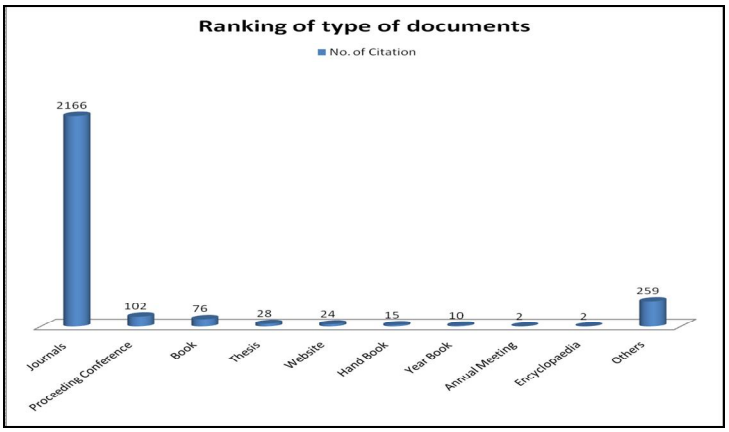
4. Sample and Methodology of the Present Study:

The literature cited in the Information Research: An International Electronic Journal is the basic source of information to access the information used for the study. Accordingly the references cited in the end of research papers of Information Research: An International Electronic Journal has been taken as the source data for this study. The total numbers of references are 2684 in the total 163 articles or research papers that published in last five volumes from 2007 to 2011. The raw data have been entered in MS- Excel sheet and further indexed for analysis. The analyzed data are interpreted with the help of text, tables and graphs.

5. Analysis and Discussion:

Table -1 Type of Cited Documents

S. No.	Type of Documents	No. of Citations	Percentage	Rank
1	Journals	2166	80.70%	I
2	Conference Proceeding	102	3.80%	II
3	Books	76	2.83%	III
4	Thesis	28	1.04%	IV
5	Website	24	0.89%	V
6	Hand Book	15	0.65%	VI
7	Year Book	10	0.37%	VII
8	Annual Meeting	2	0.04%	VIII
9	Encyclopedia	2	0.04%	VIII
10	Others	259	9.64%	IX
Total		**2684**	**100%**	

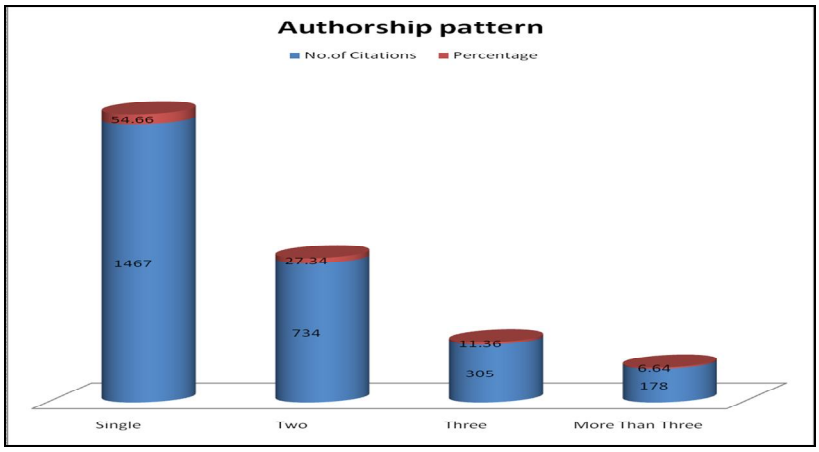


Graph-1

The above table explicates that in the ranking of document types cited by the contributors in Information Research: an International Electronic Journal. The journals is on the top most with 2166 (80.7%) citations followed by conference proceedings 102 (3.8%), books 76 (2.83%), thesis 28 (1.04%), websites 24 (0.89%), handbook 15 (0.65%) year book 10 (0.37%), Annual reports 2 (0.04%), encyclopedia 2 (0.04%) and others documents 259 (9.64%).

Table-2 Authorship Pattern

S. No.	No. of Authors	No. of Citations	Percentage	Rank
1	Single	1467	54.66	I
2	Two	734	27.34	II
3	Three	305	11.36	III
4	More Than Three	178	6.64	IV
Total		**2684**	**100%**	

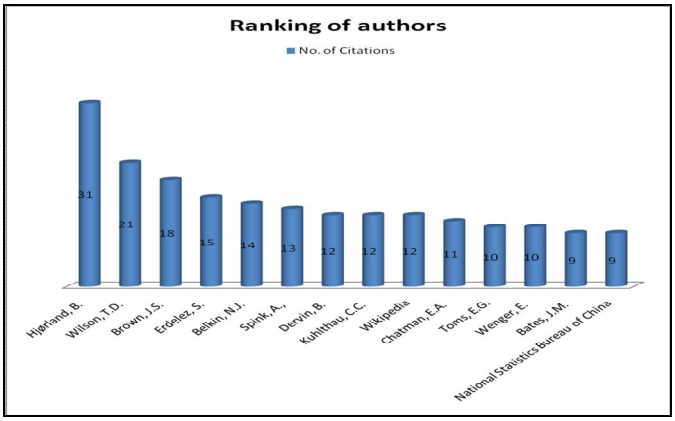


Graph-2

This table gives the brake up of all citation as per their author. It found that and double authorship pattern on the second rank with 734 (27.34%), triple authorship pattern on third rank with 305 (11.36%) while more than three authors are cited only 178 (6.64%) time by the contributors to complete their research papers and articles.

Table-3 Raking of Authors

S. No.	No. of Authors	No. of Citations	Rank
1	Hjørland, B.	31	I
2	Wilson, T.D.	21	II
3	Brown, J.S.	18	III
4	Erdelez, S.	15	IV
5	Belkin, N.J.	14	V
6	Spink, A.,	13	VI
7	Dervin, B.	12	VII
8	Kuhlthau, C.C.	12	VII
9	Wikipedia	12	VII
10	Chatman, E.A.	11	VIII
11	Toms, E.G.	10	IX
12	Wenger, E.	10	IX
13	Bates, J.M.	9	X
14	NSB of China	9	X
15	Fisher, K.E.	8	XI

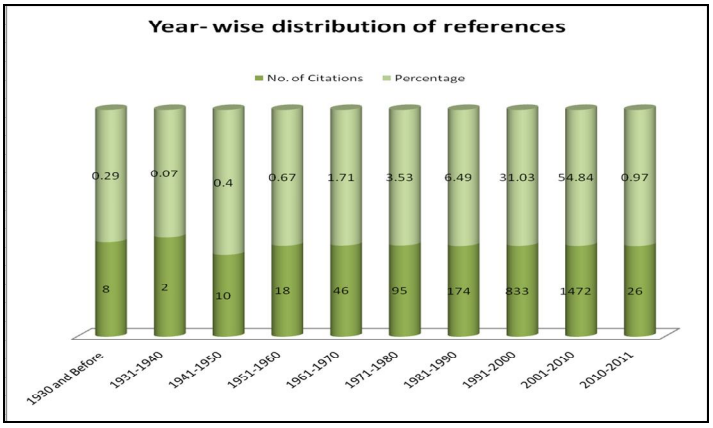


Graph-3

The table-3 explain the ranking of authors it found that in Information Research: an International Electronic Journal the Mr. B. Hjørland has been sited 31 times which is highest in the table and also found that T.D. Wilson also cited 21 times and other prominent authors were also cited in modest number.

Table-4 Year-Wise Distribution of References

S. No.	Year (In Ten Year)	No. of Citations	Percentage
1	1930 and Before	8	0.29
2	1931-1940	2	0.07
3	1941-1950	10	0.4
4	1951-1960	18	0.67
5	1961-1970	46	1.71
6	1971-1980	95	3.53
7	1981-1990	174	6.49
8	1991-2000	833	31.03
9	2001-2010	1471	54.84
10	2010-2011	27	0.97
Total		**2684**	**100%**

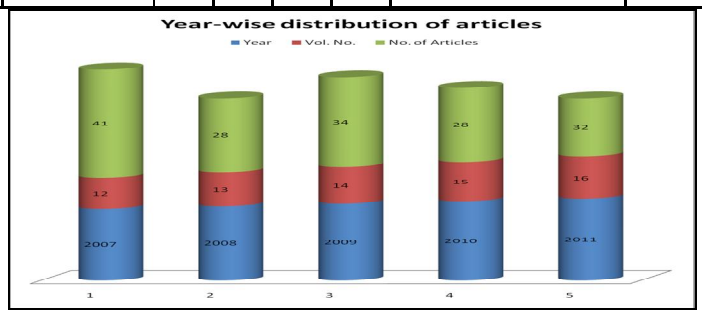


Graph-4

The analysis of year-wise distribution of citations were taken in consideration it found the citations of 2001-2010 at the first rank which were citied 1471 (54.84%) times, followed by before 1930 with 8 (0.29%) citations, 1931-1940 with 2 (0.07%) citations, 1941-1950 with 10 (0.4%) citations, 1951-1960 with 18 (0.67%) citations, 1961-1970 with 46 (1.71%) citations, 1971-1980 with 95 (3.53%) citations, 1981-1990 with 174 (6.49%) citations, 1991-2000 with 833 (31.03%) citations and 2010-2011 with 27 (0.97%) citations.

Table-5 Year-wise distribution of Articles

		No. of Articles Issue-wise					
Year	**Vol. No.**	**1**	**2**	**3**	**4**	**No. of Articles**	**Percentage**
2007	12	14	12	6	9	41	25.15%
2008	13	7	7	7	7	28	17.18%
2009	14	8	9	7	10	34	20.86%
2010	15	5	5	5	13	28	17.18%
2011	16	5	8	9	10	32	19.63%
Total	**5**	**39**	**41**	**34**	**49**	**163**	**100%**

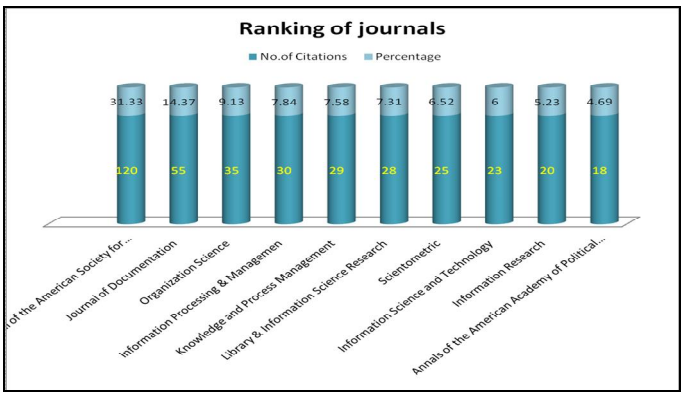


Graph-5

During the period October 4, 2007 to December 4, 2011 the total 163 articles have published in the Information Research: An International Electronic Journal. The table-5 proves that the numbers differs from year by year and there is also increase and decrease the number of articles from the 2007 to 2011. The maximum numbers of articles are 41 in the 2007 which is 25.15% of the total publications, followed by in 2008 total 28 (17.18%), in 2009 total 34 (20.86%), in 2010 total 28 (17.18%) and in 2011 total 32 (19.63%).

Table-6 Ranking of Journals

S. No.	Name of Publisher	No. of Citations	Percentage	Rank
1	Journal of the American Society for Information Science & Technology	120	31.33%	I
2	Journal of Documentation	55	14.37%	II
3	Organization Science	35	9.13%	III
4	Information Processing & Management	30	7.84%	IV
5	Knowledge and Process Management	29	7.58%	V
6	Library & Information Science Research	28	7.31%	VI
7	Scientometric	25	6.52%	VII
8	Information Science and Technology	23	6%	VIII
9	Information Research	20	5.23%	IX
10	Annals of the American Academy of Political and Social Science	18	4.69%	X
Total		**383**	**100%**	

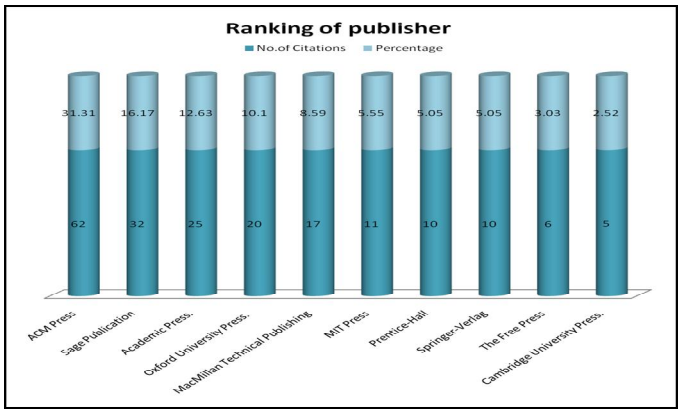


Graph-6

Table-6 demonstrates the list of journal most cited in the field is given in table and show the list of significant journal which are regularly cited in the end of research articles and papers published in the Information Research: An International Electronic Journal. A statement of the 10 best frequently cited journals are shown individually. The study covered only the journals preferred by the researcher. Journal of the American Society for Information Science & Technology has highest ranked the with 120 (31.33%) citations and Annals of the American Academy of Political and Social Science has ranked the lowest ranked with 18 (4.69%) citations.

Table-7 Ranking of Publishers

S. No.	Name of Publisher	No. of Citations	Percentage	Rank
1	ACM Press	62	31.31%	I
2	Sage Publication	32	16.17%	II
3	Academic Press.	25	12.63%	III
4	Oxford University Press.	20	10.10%	IV
5	MacMillan Technical Publishing	17	8.59%	V
6	MIT Press	11	5.55%	VI
7	Prentice-Hall	10	5.05%	VII
8	Springer-Verlag	10	5.05%	VII
9	The Free Press	6	3.03%	VIII
10	Cambridge University Press.	5	2.52%	IX
Total		**198**	**100%**	

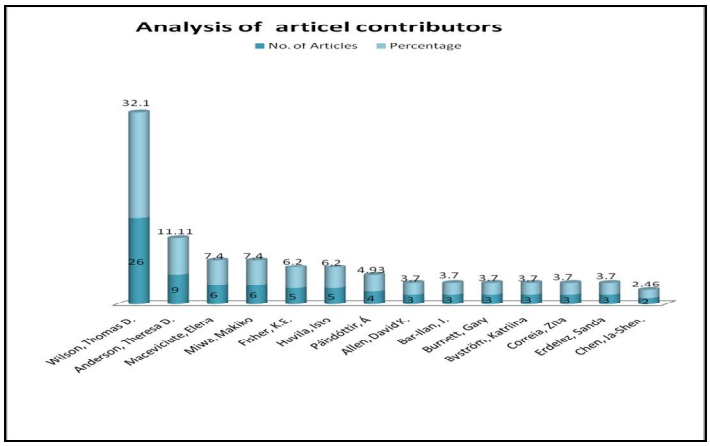


Graph-7

The above table shows the ranking of publishers cited in the Information Research: An International Electronic Journal. The best 10 publishers are ranked in this table. In which the highest number of citations 62 (31.31%) for ACM press and lowest number of citations 5 (2.25%) for Cambridge University Press.

Table-8 Analysis of Article Contributors:

S. No.	Contributor's Name	No. of Articles	Percentage	Rank
1	Wilson, Thomas D.	26	32.1	I
2	Anderson, Theresa D.	9	11.11	II
3	Maceviciute, Elena	6	7.4	III
4	Miwa, Makiko	6	7.4	III
5	Fisher, K.E.	5	6.2	IV
6	Huvila, Isto	5	6.2	IV
7	Pálsdóttir, Á	4	4.93	V
8	Allen, David K.	3	3.7	VI
9	Bar-Ilan, J.	3	3.7	VI
10	Burnett, Gary	3	3.7	VI
11	Byström, Katriina	3	3.7	VI
12	Correia, Zita	3	3.7	VI
13	Erdelez, Sanda	3	3.7	VI
14	Chen, Ja-Shen.	2	2.46	VII
	Total	**81**	**100%**	

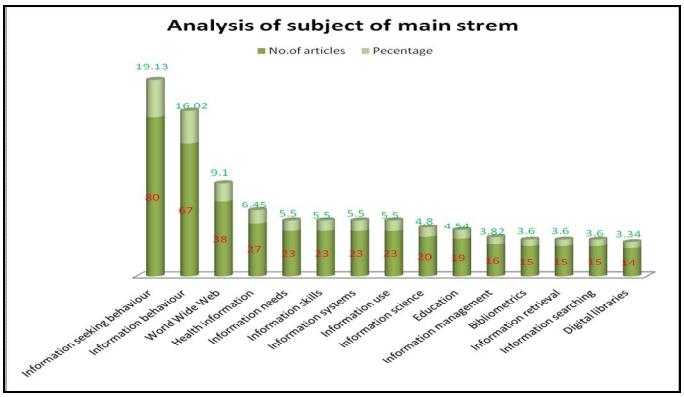


Graph-8

The table-8 illustrates that the analysis of contributors of Information Research: An International Electronic Journal. A Statement of the 14 best frequently article contributors are shown individually. In which Mr. D. Wilson Thomas at the first position with 26 (32.1%) articles contributed in the last five year (2007-2011) and Mr. Chen, Ja-Shen at the lowest position among the top ten contributors with 2 (2.46%) articles.

Table-9 Analysis of Topics

S. No.	Topics	No. of Articles	Percentage	Rank
1	Information seeking behavior	147	35.15	I
2	World Wide Web	38	9.1	II
3	Health information	27	6.45	III
4	Information needs	23	5.5	IV
5	Information skills	23	5.5	IV
6	Information systems	23	5.5	IV
7	Information use	23	5.5	IV
8	Information science	20	4.8	V
9	Education	19	4.54	VI
10	Information management	16	3.82	VII
11	Bibliometric	15	3.6	VIII
12	Information retrieval	15	3.6	IX
13	Information searching	15	3.6	IX
14	Digital libraries	14	3.34	X
	Total	**418**	**100%**	



Graph-9

The table-9 describes that which topic of library and information science is mostly preferred by the contributors for their research work to Information Research: an International Electronic journal. The 14 best topics of LIS are taken individually. The study found that the 147 (35.15%) research articles or papers are published on the information seeking behavior which is highest and the 14 (3.34%) articles or paper are published on the digital library which is lowest .

6. Findings:

Based on the analysis and discussions made the findings are followings;

6.1. The study clearly explains that the contributors of IRIEJ mostly referred the LIS journals to improve their concept for qualitative research. (Table-1).

6.2. The mostly contributors of IRIEJ prefers the single authorship pattern to taking conceptual view for their research work. (Table-2).

6.3. It is comprehensible that Mr. B. Hjørland is mostly cited by the contributors of IRIEJ. (Table-3).

6.4. It is obvious that all most contributors of IRIEJ referred the current sources to complete their research works. (Table-4).

6.5. It is explicable that the maximum numbers of articles have published in volume number 12 of IRIEJ during 2007. (Table-5).

6.6. It is clear that the mostly preferred journal by the contributors is Journal of the American Society for Information Science & Technology. (Table-6).

6.7. It is simple that mostly users prefer the reading material published from ACM press by contributors IRIEJ for their research works. (Table-7).

6.8. It is clear that the Mr. D. Wilson has contributed highest number of articles to IRIEJ who is also editor-in-chief of IRIEJ. (Table-8).

6.9. The study found that the research articles or papers are mostly published by IRIEJ on the information seeking behavior. (Table-9).

6. Conclusions:

In the end of this study, we can say that the contributors of Information Research: an International Electronic Journal refer the recent research articles and papers that published in the journals of library and information science to complete their own research works. The study also identified that some contributor of IRIEJ don't provide the bibliographical information. So, contributors must be followed all the guideline provide by IRIEJ at the time of submission a research article or paper.

7. References:

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THE ON-LINE RESOURCE TOOLS FOR EFFECTIVE TEACHING AND LEARNING: A CASE STUDY OF E-BOOKS AND E-JOURNALS IN MAHATMA GANDHI UNIVERSITY LIBRARY

MAGHESH RAJAN M

Assistant Librarian (UGC), Mahatma Gandhi University, Kottayam.

E-mail: maheshkukku@gmail.com.

JASIMUDEEN S

Reference Assistant, Mahatma Gandhi University, Kottayam.

E-mail: jasimndd@gmail.com

DR. SURESH KUMAR TV

Post Doctoral Fellow, School of International Relations and Politics, Mahatma Gandhi University.

E-mail: tvsura@gmail.com

Abstract

The advent of ICT and Internet medium plays vital role in accessing the e-book and e-journal for the benefit of the higher education. The advantages of e-resources and its wide scope in the research activities are to be made familiar to the user community. It provides the teacher and the scholar with quality professional development through anytime and anywhere access concept. Hence the user's community has to learn to identify and understand the needs, strategies, content creation and access, technology used and the new skill practice etc. In the e-book resource, the users have to identify the location, links, contribute links to assign, purchase or update the collection, create an active reading strategies, archival etc, The Tools and techniques should be best taught to them for the best use of e-journal resource collection. This paper aims to study the effective learning and teaching by e-books and e-journals, and bring out the notice of the users the on-line resources for the purpose of learning and teaching.

Keywords: e-books, e-journals, learning and teaching of e-resources, Higher education, On-line education, Public domain of resources, Access techniques to the resources.

Introduction:

The research and development in higher education by using ICTs, information resources, techniques and technologies, web based resources and on-line resources etc provided through information centers and University libraries caused important area of awareness and understanding of the information and its use. The University Grants Commission(UGC) has undertaken various initiatives over a long period to enhance the quality of higher education and the universities and their libraries are also mooted to take up the positive progress tasks to enlighten the higher education in India. In its various reports UGC has exhorted that the higher education system has to be augmented in such a way that the system of learning and teaching should also be enriched. The curriculum, ICT and Internet use, electronic resource collection and access to the various e-resources through common consortia etc were given top most priority to develop the higher education in India.

TEACHING COMMUNITY AND E-RESOURCES

Since the technology based e-resources are the base for the research, teaching and learning, the use of e-resource technology is sprang even among the teachers in the University level. The method of search techniques, software used and access techniques etc are also changing very often which needs the periodic learning process for the educators and research scholars through the workshops, seminars, hand-on training to create the ability to immediate access of e-resources like e-journals and e-books in the University library system. The collection of e-consortium of the institution should create a situation that the faculty would be satisfied with e-service provided and create more personalized and individualized learning environment.

The changing nature of ICT and its reflection over the transition in education has emerged to dimensions in learning, the need for the high quality professional development of the teachers become very inevitable to help their students in new academic standards and the teacher has to establish to meet the goal of having high quality teacher in the class room. The on-line e-journals and e-books provide the teacher to have a professional high quality through “the any time and any where access” so the teacher can build the profession in such way to involve the reflection, discussion with the

colleagues and students, and to develop portfolio of personal best practices through these resources effectively.

The teacher can modify and change the teaching module according to the learners of the subject, introduce, modify and implement the academic content, work out the curriculum, and arranging class room visit and to develop new skills of the students. To achieve these proposals, the teacher has to develop his knowledge up-to-date which can be materialized by the use of e-resources as mentioned earlier.

The best class room materials should not be based on the text books alone. The teacher has to identify the e-resources to yield information by low cost through the e-resources and utilize the variety of resources which are just around him. Hence employing these resources will support the learning and teaching in the classroom on the other side.

The learning environment of the students about these resources can be created and organized by the teacher. He may use the on-line course to introduce the resources to his students to create independent learners. Jamie McKenzie says “learning should be hands-on experience based, rather than abstract, thus meaningful learning results from students working co-operatively on tasks that are also related to their interest”.

- The teacher can use some methods of teaching the e-books access as a pedagogical habit of the students.
- Name the e-books on the specific subject of teaching and links to e-books may be written on the board.
- The students may be asked to locate the e-books, its links, and share with other networks to access.
- The low cost e-books may be asked to purchase by the students so that the norms, legal issues, regulations and the controls levied by the publishers.
- The students may be asked to refer the e-books for the presentations in the classroom and used for discussion too.
- Encourage them to create the digital portfolio and reading strategies to the students.
- The teachers should use the scholars and technologists to exploit the know-how of technology in using the on-line resources for teaching and learning.

E-books

E-books are the textual documents or digital text file which are converted and published in an electronic format. These can be displayed and read by computer systems, e-book readers and other devices with e-book software programs. This term again started to get encompassment with multimedia, hypertext and hypermedia systems based on e-book metaphor. Allen (2000) quoted that "e-book concept has been extended to include book titles that are available on-line, that can be read as email, can be retrieved by a portable electronic reading device or as a file that can be downloaded on to a computer". Again Hawkins (2000) had interpretation as " an e-book is the "print-on-demand" book where the contents are stored in a system connected to a high-speed, high-quality printer, from which printed and bound copies are produced on demand with the possibility of buying chapter-by chapter, customized books". The e-books have the following characteristics:-

- Easy and Multi-access: As these resources are the networked product which can provide multiple points of access by 24 hours a day 7 days a week with multiple simultaneous users, and ensures the easy access to the resources.
- Speed and accuracy: An electronic resource is lot quick to search the retrieve information from, and to integrate that information into other material on the web content. It is then, assured to cross-search or cross- reference between different publications to reach the accurate destination of required information.
- Functionality and user approach: It allows the user to approach the publications to analyze its content of the text by click of the mouse on search mode most functional.
- Content and deep indexing: The resources are more importantly the material that can consist of mixed media and the variety of format and language which can be easily accessed to the content by deep indexing.
- More interactive nature: the e-books are more interactive than that of the printed materials as these are created and used by the free software and web converters or the MS Word add-ins.

OPEN ACCESS E-BOOKS

OAPEN: Open Access Publishing in European Networks	OAPEN HAVING 1000 Titiles
Google Books	www.googlebooks,com
The Universal Digital Library	MillionBooksProject www.ulib.org/ULIBAboutUs.htm
Project Gutenburg	www.archive.org/details/gutenberg
American Libraries	www.archive.org/details/americana
Community Books	www.communitybooks.org
Biodiversity Heritage Library	www.archive.org/details/biodiversity
UN University Full-text Publicaitons	www.library.yale.edu/govdocs/un.html
UC Press e-books, 1982-2004	www.cdlib.org
Taylor and Francis	http://www.ebooksstore.tandf.co.uk/html
National Academy Press	http://www.nap.org
Follett Corpration	http://ebooks.efollett.com
ASCD Full-text Books	http://www.ascd.org/cms/index.cfm/
eBookopolis Academic materials	http://ebookopolis.com/index.asp?entrance
CUP e-Bookstore	http://www.cambridge.org/uk/ebookstore/
eText	http://www.etext.net/index.php
Center for Electronic Texts in the Humanities	http://www.ceth.rutgers.edu/
Educating the Net Generation	http://educause.edu/content.asp
RETAIL CATEGORY	
Amazon	http://www.amazon.com
Adobe Glassbook	http://bookstore.glassbook.com/store
Barnes and Noble	http://www.bn.com
Contentville	http://contenetville.com
PreviewPort	http://ebooks.previewport.com

Accessing e-books:

The Joint Information systems Committee (JISC) has identified four means of accessing e-books.

1. Downloadable e-books in which the user can download the text and document usually from the public domain of web site by using specific software.
2. Dedicated e-books readers in which reliably dedicated software and hardware are required to read and download the text and documents.
3. The web-accessible e-books in which the subscription fee is made for one time or the on-going access fees in accordance with the nature of user access.
4. Print on demand books in which the contents are stored in a system on web from which you can have the printed copies on demand. This process is not an e-book delivery electronically but can readily satisfy the user needs.

How to frame the e-book collection:

The selection and acquisition of e-books for any university library should be primarily based on the information needs of the users, scholars and faculty of the institution. The selection of e-books should also be based on the content selection and evaluation criteria as followed in other e-resources to satisfy the dare needs of the users.

- A bundled package by the publishers consists all areas of subjects
- The pick and select package by the institution on the relevant subjects.
- Priority to acquire the items on heavy demand on specific field of study and research
- Importance given to the core reference collections like encyclopedias on various subjects.
- Collection of monographs and textbooks found essential to the course of study and, rare and out- of -print items.
- Importance given on the collection on the scholarly materials found out- of-print
- Finally the subjects of high IT awareness and access techniques should be propagated.

Advantages of E-books:

Portability is one of the advantages of the e-book so that it can be taken to anywhere else by a simple storage device or by a computer system. The instance Access is ensured by

the e-book mechanism as the subscribed items are readily available on web or by a subscription based local archiving. The search- ability is another advantage of the e-book collection on subject, author, keyword, and other searching entities as it ensures the deep indexing. The Linking is another landmark by which the user is connected and linked with other sources or web. It accommodates multimedia customization and long term preservation of the materials in the soft form. The multiple title search in single book is possible and the On-line Dictionary Link to other sites to verify, examine and correct the search results. The out –of print concept is ceased away from the market. It is the readers choice to add several chapters from the several books and updates the books in the minimal price in every renewal time. It ensures the low publishing cost and low distribution cost so the cost of paper on printing is saved at large level. The physical space saving is another important merit of the e-books welcomed by university level libraries.

E-journals:

The e-journals can be said that the journal published on-line with the full text journal articles is available through the web platform entrusting the browsing and searching functions. Any library user can use the e-journal on the Library website within the library or anywhere in the campus by Campus Wide Network or by WiFi. The e-journals aim to provide the specialized form of electronic documents consist of materials needed for academic research and study.

The collection of e-journals is otherwise termed as e-journal consortia either by subscription or by the sharing of networks through MOU between the institutions. The e-journal consortia are became essential for the libraries due to the explosion of information, formation of information society, amalgamation of information natives on study and research, the diversity of user needs and demands and the financial non-viability to meet the self-sufficiency. The best access to the e-journals is more important than that of the collection and consortia. The search and access of e-journals is based on the keywords, subject, title, e-journal collection, author and so on to retrieve the particular and relevant text, articles or the needed information.

The e-journals are also available on various modes of consortia such as

Open consortia where the member can join and leave by their wish like INDEST Consortia available at : http://paniit.iitd.ac.in/indest/

Closed Group type allows only the institutions having collaboration and affiliation like CSIR, IIM are available at: CSIR e-journal consortium http://www.niscair.res.in

Centrally funded type primarily depends on the parent body like the INFONET by UGC and the ICMR and CSIR by DSIR, are available at: UGC INFONET

http://web.inflibnet.ac.in/info/ugcinfonet/ugcinfonet.jsp

http://icmr.nic.in/icmrnews/e_consortia.htm

Shared-budget type in which the participatory libraries form a consortia like FORSA (Forum for Resource Sharing in Astronomy and Astrophysics)

http://www.iiap.res.in/library/forsa.html

http://niscair.res.in/ActivitiesandServices/MajorProjects/majproj.

www.dsir.gov.in/pubs/itt/itt020/mylibnet.htm

http://www.rguhs.ac.in/hn/newhell.htm

Publisher Initiatives like the Emerald Publishing Group having the Emerald Full- Text Library, Elsevier and MathSciNet

www.emerald.com

www.sciencedirect.com

http://www.ams.org/bookstore/mathsciprice

The National consortium type where the national level licensing of products are entrusted like INDEST- AICTE, UGC- Infonet. INDEST –AICTE consortia, CSIR Consortia and UGC consortia etc are the examples of consortia at national level to assist and share the web resources by the institutions under its purview.

Open Source Public Domain e-journals and Open Access initiatives:

Budapest Open Access initiative defines the OA literature " as its free availability n the public internet, permitting any users to access, read, download, copy, distribute and print, or use it for rightly legal without committing any barriers of legal, financial and other technical means by accessing through the freely access of the Internet". It ensures the open access of full text is greater than that of any subscribed

consortium. The OA repositories literature has two categories like Gold and Green. The journals are permitted to access completely on Open Access is referred as Gold where as the open access delivered by the repositories or achieves are termed as Green.

The journals are often published online in an electronic format which can be available on the Internet. Some of the websites given below are the best suit examples.

The Electronic Library of Mathematics	http://www.emis.de/ELibM.html
e- prints in Library and Information science	http://eprints.rclis.org/
Open Humanities Press	http://openhumanitiespress.org/index.html
Orgnaic e-prints	http://www.orgprints.org/
Scientific Electronic Library Online	http://www.scielo.org/php/index.php
Bio medical central	http://www.biomedcentral.com/
Ariadne	www.ariadne.ac.uk
Cybermetrics	www.cindoc.csic.es/cybermetrics
First Monday	www.firstmonday.org
Information Research	www.InformationR.net/ir/
Journalof Digital Information	www.jodi.ecs.sonton.ac.uk
Journal of Electronic Publishing	www.press.unich.edu/jep
Journal of Information, Law and Technology	www.elj.warwick.ac.uk/jilt
D-Lib Magazine	www.dlib.org
LIBRES	www.libresaurtin.edu.ac
IFLA	www.ifla.org

Advantages of the E-journals Consortia:

As the subscription of the Consortia has been a huge capital investment as far as an institution is concerned, it simply opens the gateway for the electronic archives for the institutions itself. The access and download process can be effectively used for the future archives, such as institutional repositories. As like the velocity of a book is measured by the date slip of the book, the access, availability and monitoring the usage statistics periodically to evolve and alter the collection policy of the consortium. As it is retrieved from the consortia as a shared network resource through on-line, the net cost will be so minimal than the hard print category.

The unrestricted limitations of access to the resource and document without any time limit, the user can access and read the document through the Internet. The web 2.0 in the new Internet technologies accommodate the audio- video and sound, and other image formats to access and down load with out any change of the original.

The articles and related materials will have further link facility to other websites, networks, and even to the e-book consortia so that the user can get the documents as relevant as to his subject of research. It also provides different search facilities to retrieve the documents which include cited journals also. The e-journal access habit of the users help the librarian to develop a common resource databases consists of the subject interest of the users which will, in future, help to formulate a common pool of resource collection to avoid the duplication of subscription from the foreign publishers.

The best method of Consortium provides access to unsubscribed materials and further helps to develop the union catalogue practice among the participating libraries so as to avoid the duplication. It ensures the effective faster document delivery services with high quality literature. It ensures the better search facilities and other current awareness services along with the access services.

Mahatma Gandhi University Library:

The Mahatma Gandhi University is located in the central parts of Kerala came into being in 1983 which caters seven faculties of Arts, humanities, social sciences and sciences like chemistry, physics, nano-technology, environmental sciences and Bio-Sciences.This University has research collaboration with national and international organizations like UGC, CSIR, ICMR, BARC, ISRO, Toronto University, Max Plank Institute of

Technology, Edinburgh University, Ruth Cohn Institute etc to facilitate of cutting edge of technologies and methods. As a first initiative of the Universities in Kerala, the e-journal consortia were introduced. Later the e-these archive was brought out operational in 2009 and a state level award was also honored by the State Government for the e-theses archives even though the age of University is simply minimal, it could possible to made success as compared to other state universities in Kerala.

The Collection and e-journal Consortia in M G University:

The UGC-INFONET service has been enabled by the Internet connectivity of 1mbps leased line to have an access to 7000+ journals and 20 various on-line databases. DELNET,IIS, IITs, NISCAIR AND NCL are the important institutions to whom the membership tie-up to the Mahatma Gandhi University is also maintained to have an effective on-line electronic journal services. List of journals subscription is as follows which are available at www.inflibnet.ac.in/

FULL TEXT E-JOURNALS (PUBLISHERS/AGGREGATORS

Name of the journal and database	No of Titles
American Chemical Society	37
American Institute of Physics	18
American Physical Society	10
Annual Reviews	33
Blackwell-Wiley	908
Cambridge University Press	224
EPW	1
Elsevier Science	1036
Emerald(LISCollection)	29
Institute of Physics	46
JSTOR	1401
Kamla-Raj Enterprises	21
Nature	01
OJS@INFLIBNET	04
Oxford University Press	206
Portland Press	09

Project Euclid	34
Project Muse	411
Royal Society of Chemistry	29
SAGE Publicatons	30
SIAM	14
Springer Link	1389
Taylor and Francis	1173

E-theses

The Ph.D awarded by the Mahatma Gandhi University to the scholars who have registered to the programme and whose theses are brought to the purview of this category. All such theses are digitized and made available on the web. The techniques and special aspects of the theses are not relevant to this context, hence the learning process alone is taken into account here. The e-theses are available in the open access from www.mgutheses.org . The INTUTE which is the international open access online service provider of the resources for the education and research which always examine and investigate the web resources useful to the community has selected the open access archives of doctoral dissertations of Mahatma Gandhi University to be one of the best resources for learning and research.

E-Books of the M G university

The Mahatma Gandhi University Library has the perpetual access and subscription to the e-books through the two publishers to enable the scholars and teachers to have learning and teaching capabilities to act in accordance with the emerging dimensions of the information society. The university has been subscribed the e-books in the following publishers:

www.oxfordscholarshiponline.com from the Oxford University Press

www.tandf.co.uk From Taylor & Francis .

The e-books in the Mahatma Gandhi University library consists of the collection of

"package offer" rather than "pick and select" by 2700 titles from OUP and Encyclopedias of Four subjects from the Taylor and Francis.

E-theses and dissertations

Networked Digital Library of Theses and Dissertations (NDLTD)Vidyanidhi
MGU PhD Theses Archive
CalTech Electronic Theses and Dissertations
Shodhganga-Indian ETDs (INFLIBNET)
etd@IISc: IISc Repository of Theses and Dissertation

E-Books in an Academic Environment of the University:

Most of the scholars in the university said that they would use the e-books for their research work than the print version due to the reason that the e-books can be accessed instantly by the hypertext than the hard. The remaining scholars who always depend on the hard copies, it is found that they are not properly given the training and orientation programs. Portability and the e-book can be used at any time would also encourage the scholars to use more.

The students and scholars of the University have the opinion that they are mostly depend on the e-books to find their sources and found useful as these devices are so portable, they can access "any time and any where" and make them so organized. The learning of the e-books on the cost and subscription, the content and format, publisher's restriction on the access by TPM and DRM, the need for the archives of the essential books for the future use etc are learnt through the use and the teaching of such things through the training and orientation to the both the user community so as to ensure the lifelong learning.

Objective of the Study:

The study of the e-books and e-journals provided in the University library covers the following areas of objective to ensure the best use of these resources.

- To find out the usefulness of the resources aimed to provide for the teachers and scholars in the environment.

- To find out various types of electronic information resources and services used by the scholars and teachers.
- To find out their needs for improving skills in the use of information resources
- To know the existing technological infrastructure of the M G University Library.
- To find out the whether these resources are best used by the user community.
- Whether these resources are satisfying the aspects of currency and up- date of resources or not?
- To find out the use pattern of the resources are restricted any way by the service provider
- To find out the user's knowledge and awareness in finding the information rightly needed to them
- To find out any publisher's restriction on e-books affect the scholarly access.
- And how to overcome the varying difficulties of access documents and related documents access with other navigation.

Methodology:

A structured questionnaire method is used to collect data from the respondents of the scholars and teachers and interview conducted with the librarian to draw the inferences. To find out the results and inferences, a structured questionnaire consisted of 20 questions, and the findings are based on the data analysis.

Data Analysis and Findings:

Out of 125 questionnaires issued to the user community, only 95 were received for the study. Out of which 23 numbers of users are teachers. More than 84.7% of scholars belonged to the Science subjects and 15% of them are belonged to social sciences. The percentage of teachers in the science faculty comes around 69.6 and 30.4% belongs to social sciences.

Out of 72 scholars, 49% of them using the Internet between 1-2 hours daily as against the 26% are using in between 2-3 hours per day which means the hours of use of Internet resources are marginal than the actual use.

The peripheral vision on the research process in which 95.8% (69 out of 72) of the scholars are satisfied with the right way navigation and relevant links to the relevant

information used for the research purpose. The remaining 3 scholars are not aware of the peripheral vision basically.

The 93% of the scholars are agreed with the greater inflow of information and scholarly communication and having greater satisfaction and the remaining 5 scholars do not feel the flow of information due to the deficiency of know-how. The evaluation and scrutiny of data access are also acknowledged by this way.

The currency and update of the e-resources are acknowledged by the 95% of the scholars and remaining 7 scholars do not give much importance to verify the currency. The training and orientation programs are conducted by the university Library in which the 74% (59 out of 72) of scholars are attending the periodical training classes. The remaining 13 scholars enabled to attend the class by many reasons. Out of 72 scholars and 23 faculty members, 95% of the users agreed with the quality of resources provided and satisfied with the on-line resource access than the print and other medium.

Out of 72 scholars, 66 scholars agreed with the quality of content and the quantity of resource acquired in the library, and the 91% of the users demand to have these services in the public domain of service. This percentage of the users also remarked that the copy and down load facility in the e-book access has been felt reduced by the publisher's restriction too.

Findings and Conclusion:

Most of the scholars and teachers using the e-books and e-journals are belonged to the science faculty in general. The interest of accessing e-resources by the social science scholars and teachers are comparatively less.

The number of computer systems for the Internet use allotted to the scholars is found less and the time limit is also minimized to 30 minutes for the scholarly research. It does not validate the best use of e-resources in the consortia and hence the time allotted to the scholars should not be restricted and good number of computer systems may be provided.

The most of the scholars are found unfamiliar with the resources, services and access techniques, so the periodical orientation and training programs should be

conducted in general and the subject wise the programs should also be taken in to consideration.

The Wi-Fi facilities and Internet connections in the residential areas of the scholars and teacher by ensuring the misuse of the facilities and a separate web- centre facilities should augmented as per the directions of the UGC with all facilities other than the extended time of the library working hours.

The subscription and network sharing of the e-resources should be enhanced along with more provision for the database search in this connection.

The dissatisfaction of the users on the ineffectiveness of downloading documents from the e- book archives enforced by the publishers should be studied well and the rules and agreements, licensing and other terms and conditions should be monitored well and bargain for the betterment of the user community.

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WEB 2.0 AND FOLKSONOMY

MOHMEDHANIF NASHIPUDI
Librarian,
Government First Grade College,
Ramdurg, Dist-Belgaum,
Karnataka-591123
E-mail: hanif.bn@gmail.com

Abstract

Web 2.0 services are expected to replace desktop computing applications for many purposes. Tagging is not a new concept to library professionals. But what is new is that tagging is being done by everyone, no longer by only a small group of experts. These tags are being made public to share with others. The development of the internet and search engines led users to do their own searching. In the Web 2.0 environment, users are also doing their own content creation and management. This paper describes the folksonomy approach to organizing the content, its pros & cons, and its application in libraries.

Keywords: Tagging, Folksonomy, Web 2.0, Social Tagging, Social Bookmaking

1. Introduction

The emergence of web 2.0 technologies is making the users part of the systems or services. Contrary to earlier technologies, web 2.0 technologies allow users to contribute to the system or service. This enables users to add a personal touch and update the content based on their context. Blog, Wiki, RSS, Pod Casting, Instant Messaging, Social Networking, etc are some of the web 2.0 technologies.

Web 2.0 is a set of economic, social, and technology trends that collectively form the basis for the next generation of the Internet—a more mature, distinctive medium characterized by user participation, openness, and network effects. Web 2.0 is the second generation of web services which emphasis on collaboration and sharing, social networking: blogs, wikis, tagging and thus leverages the “wisdom of the crowd”.

The wealth of information being created on the Internet is not being properly organized. To add to the woes, Web 2.0 technologies allow users to generate more & more content in less time. But, most of the Web 2.0 technologies have the flexibility to allow user to describe the content using keywords, categories, or labels. This helps in identifying the content from the user context and helps for future retrieval.

Folksonomy is important field of web 2.0 services. User index resources by themselves with free keywords, which are called tags. There are a lot of services online, especially for index bookmarks. Del.icio.us is here the most famous one. But its not the only benefit, that users can index the resources, they can also find who has saved the same resources like them, and which keywords they take. The usages of keyword can be presented in a tag cloud, where common used tags are bigger than tag which are used rarely.

2. What is Tagging?

Central to Web 2.0 is the idea of Tagging – adding keywords to content in order to categorize it. This is similar to subject indexing but without a controlled vocabulary. Though the concept of tagging is not new to library professionals but what's new is that the tagging is done by everyone and the same is made available to public.

To classify a digital content like a piece of information, a photo, an audio file, etc, users can choose a tag which is meaningful to them. Most of the sites allow users to create more than one tag to content. This gives the flexibility for the user to create more number of tags which are appropriate to the content as per his/her context or understanding. Once these tags are assigned to the content, they will act as index terms which will help in the future for retrieving the content.

A tag is a keyword that is added to a digital object (e.g. a website, picture or video clip) to describe it, but not as part of a formal classification system. The concept of tagging has been widened far beyond website bookmarking, and services like Flickr (Photos), YouTube (video) and Odeo (podcasts) allow a variety of digital artifacts to be socially tagged.

3. Why do people tag? The following are some of the reasons as to why people tag a piece of information [1]

Personal Use - People have a common goal of cataloging their own information.
Community - The social nature of tagging stimulate a sense of community by sharing it with others. Offers a chance to view what people have tagged with content, also how others categorized a particular resource.
Massive rate of publication online between mediums such as blogs, wikis, etc. make a controlled vocabulary impossible.

4. Definition of Folksonomy

As per Vander Wal, Thomas [2], "Folksonomy is the result of personal free tagging of information and objects (anything with a URL) for one's own retrieval. The tagging is done in a social environment (usually shared and open to others). Folksonomy is created from the act of tagging by the person consuming the information."

The essence of folksonomies is that the tags assigned are chosen by the user. A key feature of a folksonomy is that tags may be reused many times, providing information about the popularity of the tags themselves as well as information about emerging areas of interest.

5. Need for Folksonomy

Tagging keywords to a digital content was the practice started during digital era. It helped the authors or creators to attach related keywords to the digital content so that it becomes easy to identify the same. But this had a control on the way the author or creators attach keywords to the digital content – Only they can attach a keyword from their perspective. This has the limitation of seeing things from others perspective.

Weinberger, David [4] says that there are two key differences that will explain the current increase of interest in folksonomy --

Firstly, folksonomy allows not only authors or creators to tag the content but the users can also tag the content from their perspective. When it comes to searching for this piece of content, the any user can get this content if he/she describes this content from author or other users' perspective. For e.g, a web site may be tagged by the author as content management whereas one

user may tag it under a specific company because a case study or some related information is available there and another user may tag it under content management vendor analysis, etc. These users will tag the page differently from the author and differently from each other because the page means something different to each of them. So, any user searching for any of these tags will find the same site.

Secondly, folksonomy is social. For example, at http://del.icio.us, users enter bookmarks (URLs) they want to remember, adding a word or two – tags – so that they can retrieve them later. Del.icio.us users can see not only everyone else's bookmarks, but also all the bookmarks tagged with a particular word. For example, if you enter http://flicker.com/, you can see all the tags del.icio.us users have tagged with this URL, like "flicker" or "photos" or "images", etc.

These two aspects make folksonomy highly useful. The folksonomy movement says, in effect, that we're not going to wait for the experts to deliver taxonomy. Instead we're just going to build one ourselves. It'll be messy and inefficient, but it will be good enough. And, most important, it will be ours, reflecting our needs and our ways of thinking.

5.1 Advantages of Folksonomy

The following are some of the advantages of Folksonomy [3]:

- **Multidimensional:** Users can assign a large number of tags to express a concept and can combine them.
- **Meaningful words / Local (natural) Language:** Users can use words that have meaning for them. These words are likely to be current and reflect local usage.
- **Sharing:** Tags can be shared, creating knowledge through aggregation. This is an easy way for people to participate.
- Multifaceted: Instead of having to store an item in a single folder, it can be tagged with many different terms and each of these could be used to generate an instant collection.
- **No formal Training required:** Tagging is very quick, simple and straightforward. Users can apply tags without formal training in classification or indexing.
- **Inexpensive:** Low/No Cost alternative to a traditional taxonomy for cataloging Web-based resources.
- **Dynamic:** The changes in concepts/subjects can be updated by the users at any time.
- New Descriptors / Representations: With individual perspective new descriptors / representations for content will emerge.
- **Flexible:** Anyone can tag anything with anything so there are no rigid constructs.

5.2 Drawbacks of Folksonomy

The following are some of the drawbacks of Folksonomy [3]:

- **Predominantly user centric:** Since the folksonomy is user centric, each user may tag the same content differently, and also a user may tag the same content inconsistently over a period of time.
- **Over tagging:** Too many tags on content can make search and retrieval meaningless – recall is high, but precision is low (lots of irrelevant results).
- **Inconsistency:** Misspellings, different punctuations, capitalization, variations in spelling all show up as different tags and cannot be used for filtering and navigation. Different

terms may be used for the same concept (again by different users or by the same user – users will not necessarily be consistent. Regular indexing and cataloguing rules such as singular *vs* plural forms, use of hyphens and spelling conventions are not established in a folksonomy.

- **Lack of Synonym Control:** A search will not give a complete results list due to lack of synonym control.
- **Lack of Hierarchy:** Folksonomies are flat; there are no parent- child relationships, no sub-categories. Makes for a less robust classification system than the traditional taxonomy. This limits the ability to add context to tags.
- **Lack of Context:** The same term can be used for different concepts. Typically, no information about the meaning of a tag is provided. For e.g., the word "play" could occur in an educational resource collection in the drama context or the games context.
- **Lack of Precision:** Folksonomies don't have any hierarchical relationships, making searches less precise.
- **Lack of Recall:** Because of lack of synonym control, a search of a folksonomy will not affect a complete results list because of the use of similar tags. For e.g, a search for cat will usually not retrieve resources which have been tagged with kitten, feline, or tabby.
- **Susceptible to Spam:** Because these systems are open, spammers and/or unethical users out to corrupt a system could propagate bad tags.

Overall, tags are uncontrolled and are not connected to each other by a reference structure, which in formal systems is used to link related terms and narrower or broader terms. A more subtle issue is that people may behave differently (consciously or unconsciously) when tagging other people's items as opposed to their own. The objectivity of a professional indexer is not necessarily a feature of social tagging. The creation and application of tags by users who are not experts in information management leads to the problems described above.

However there are also clearly great benefits in user tagging and folksonomies, especially in the richness, currency, relevance and diversity of the terms used, and the collections of resources created. It is important to try to retain those qualities in any attempt to control folksonomies.

6. Application of Folksonomy in Libraries

As per Zoellner, Kate [5], most librarians recognize that library users have difficulty finding information using the library catalog, because the catalog is based on complex cataloging standards (i.e., Anglo-American Cataloguing Rules) that categorize items under Library of Congress Subject Headings. While librarians are familiar with these subject headings, and how to use them to find resources, most other people today are not. Before online catalogs, library users who wanted to access a library's materials saw value in learning the subject headings. With online catalogs, it became possible to search for items using keywords; the need to learn subject headings diminished, and the subject terms within the catalog lost value for most library users. And yet, the keywords that people think to use for a search often do not translate into terms within the catalog. For example, a student may search for plays and retrieve no results, because the catalog describes plays with the (subject) term drama.

Some libraries are utilizing tagging technologies to address this situation, allowing library users to define how items are described. The aim is to allow a local folksonomy to develop (collectively, over time) that makes discovering resources easier for library users. Library users'

tags are currently a supplement to traditional cataloging rules that libraries use to describe items, not a replacement for the standards (which continue to hold value for libraries).

By adding tagging abilities to library resources, libraries are enabling library users to more actively participate in how resources are described. This process will ideally lead to localized folksonomies that better meet the needs of specific communities, fostering resource discovery in new ways. Importantly, tagging, social bookmarking, and folksonomies are part of the larger online social world. These practices and services will likely continue to be enhanced and grow, and libraries will evolve with the development of these new information technologies.

Tagging can be applied to the LMS for editing the subject headings from the user point of view and there by enhancing the indexing and relevancy of the searches, making the collection more dynamic.Tagging would greatly facilitate the lateral searching.

6.1 Few Examples

Thunder Bay Public Libraries (TBPL) internet links are available on del.icio.us at http://del.icio.us.com/tbpl

University of Pennsylvania's PennTags (http://tags.library.upenn.edu/) is a self-hosted social bookmarking application. PennTags not only acts like a typical social bookmarking application, it also is integrated directly into the library's online catalog. Catalog records show tags, and library patrons can use PennTags to create resource lists for class projects easily. Because it is campus-specific, PennTags doesn't capitalize on the power of mass tagging in the same way LibraryThing does, but it has been successful for student and faculty personal use.

SOPAC or the social library catalog integrates tagging directly into the Ann Arbor District Library (AADL - http://www.aadl.org/), MI library catalog. Anyone can create an account on the AADL web site and begin tagging. User tags are displayed in catalog records as well as viewable in a catalog wide tag cloud. Getting back to tagged resources is as easy as logging into an account and clicking on My Tags. Users can also rate, review, and comment on items in the catalog.

LibraryThingwww.librarything.com
http://www.librarything.com/work/660415
University of Pennsylvania
http://tags.library.upenn.edu/

7. Folksonomy-based systems: Some of the most popular, widely used folksonomy-based systems are -

- Del.icio.us (www.del.icio.us) – Delicious [6] is a social bookmarking service that allows users to tag, save, manage and share web pages from a centralized source. With emphasis on the power of the community, Delicious greatly improves how people discover, remember and share on the Internet.
- CiteULike (www.citeulike.org) – CiteULike [7] is a free service to help users to store, organise and share the scholarly papers they are reading. When users see a paper on the web that interests them, they can click one button and have it added to their personal library. CiteULike automatically extracts the citation details, so there's no need to type them by the users. It all works from within users web browser so there's no need to install

any software. Because users library is stored on the server, users can access it from any computer with an Internet connection.

- Connotea (www.connotea.org) – Connotea [8] is a free online reference management for all researchers, clinicians and scientists. Saving references in Connotea can be done by saving a link to a web page for the reference, whether that be the PubMed entry, the publisher's PDF, or even an Amazon product page for a book. Connotea will, wherever possible, recognise the reference and automatically add in the bibliographic information. In Connotea users assign keywords (or 'tags') to their references. Connotea shows all the tags users have ever used, so it's easy to get back to a reference once users saved it.
- Flickr (www.flickr.com) – Flickr [9] is an image and video hosting website, web services suite, and online community platform. In addition to being a popular Web site for users to share personal photographs, the service is widely used by bloggers as a photo repository. Its popularity has been fueled by its organization tools, which allow photos to be tagged and browsed by folksonomic means.

- Furl (www.furl.net) – Furl [10] is a social bookmaking site that makes it easy to save, share, and explore favorite web pages. LibraryThing (www.librarything.com) – Library Thing [11] is an online service to help users catalog their books easily. Users can access their catalog from anywhere—even on their mobile phone. Because everyone catalogs together, Library Thing also connects users with the same books, comes up with suggestions for what to read next, and so forth.

8. Recommendation

Folksonomy is a new opportunity for users to participate in organizing the content. New applications based on this concept should be developed. At the same time, it is also essential to investigate the pros and cons so that it may be used appropriately. The new applications may also have a top level categorization done so that users can browse through the content sets. Also, users should be able to add tags to them. This will have both the positive aspects of categorization and folksonomy approaches.

9. Conclusion

Web 2.0 technologies have been adopted by the group of libraries to recalibrate the processes and the paradigms of the library and information services. This new model is all about the amalgamation of the various tools and technologies of the web 2.0 into the library services. Web 2.0 is not just a technology or a thing but a new paradigm and a state of mind. The heart of Library 2.0 is user-centered change. It is model that encourages constant and purposeful change, inviting user participation. The library has had a web-presence for many years, and with Library 2.0, its patrons will be joining it. There is a certain need for implantation of Web 2.0 technologies in libraries.

Folksonomy represents some of the good and bad aspects organization of content. Its uncontrolled nature is disorganized, suffers from problems of imprecision, ambiguity, etc when compared to a well developed controlled vocabularies. Conversely, systems employing free-form tagging encourages users to organize content in their own ways. These systems are highly responsive to user needs and vocabularies. Overall, transforming the creation of explicit metadata for resources from an isolated, professional activity into a shared, community activity by users is an important development. These aspects should be explored and considered for future systems development.

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Application of Information Communication Technology (ICT) in Research and Development Organizations Libraries of M.P.: A Critical Study

VIJI NAIR
Research scholar
M.P. Bhoj (open) University
vi_jins@yahoo.com

Abstract

Information communication technology (ICT) plays a vital role in enhancing efficiency in development of library service. The paper deals with application and designing of information communication technology in selected research and development organizations of M.P. Today library are equipped to accomplish the newly information communication technology based services. ICT based services fulfill the information needs of the users at the right time in the right place to the right person.

Keywords

Information communication technology (ICT), Online databases.

Preamble

Information is indispensable source in information world. Library professional should be aware of latest and advance technologies to continue and maintain the importance of service offerings utilization of ICT services in present research and development libraries is optimistic to gain right information at the right time in the right place and at the right cost. ICT helps to progress the research activities of organization through library and it condense the work stack of the library personnels. The e-resources (both online and offline) have occupied a considerable space in the library collection, the transaction of library materials are fully automated, new web based services are offered by libraries to attract users participation in redesigning the library system and services

and so on. These changes are mainly due to the development and impact of Information Communication Technology (ICT) in libraries which have also made sea changes in all walks of life. The ICT tools and services are being used in libraries to mange libraries more efficiently and to cater users demand properly.(1)

Definition

The term Information and communication technology (ICT) is more commonly used. Whilest Information Technology (IT) has been the accepted term in the UK and USA, it is not the universal term Telemetric is widely used in France, and Information is also used elsewhere in this sense.(2) ICT deals with the use of electronic computers and software to store, convert, process, retrieve, communicate and transmit information.

Information and communications technology or information and communication technology usually abbreviated as ICT, is often used as an extended synonym for information technology (IT), but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers, middleware as well as necessary software, storage- and audio-visual systems, which enable users to create, access, store, transmit, and manipulate information. In other words, ICT consists of IT as well as telecommunication, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions.(3)

Scope and Limitation

The scope of the study is limited to selected research and development organizations library users, namely- Bhaba Engineering Research Institute (BERI), Bhopal, Regional Research Laboratory (RRL), Bhopal, Tribal Research Institute (TRI), Bhopal, Tropical Forest Research Institute (TFRI), Jabalpur, State Forest Research Institute (SFRI), Jabalpur and National Research Centre for Soya Bean (NRC-SOY), Indore.

Literature Review

Haneefa, Mohamed (2007) investigated in the study the application of information and communication technologies (ICT) in special libraries in Kerala (India) and revealed that ICT based resources and services were not reaching the users to the expected extent. A good number of the library users were not satisfied with the application of ICT in their libraries and indicated inadequate ICT infrastructure as their major reason for dissatisfaction.

Bulu Maharana,Choudhury (B K) and Dutta (Syamshree) (2004) revealed about the policies and practices of development and management of e-resources in the selected R&D libraries of kolkatta city. Depicts the current state of e-collection, policy statements and management practices under vogue. Feasible recommendations have been put forth for the development of a balanced collection of electronic resources and its effective management.

Objectives

- Provision of services with ICT application.
- To know the place preferred by users to access ICT services.
- To identify the problems with ICT application.
- To analyse the possible reasons for not using ICT services in library.

Research Methodology

This paper is based on questionnaire method. The questionnaires were personally distributed to the students of Research and development organizations libraries. A random sample of 200 students was selected. The questionnaires were distributed to the students who were present in library premises and library reading room. 160 filled in questionnaires were returned by users with the overall response rate being 80%. The collected data were analyzed, classified and tabulated by employing statistical methods.

Data Analysis

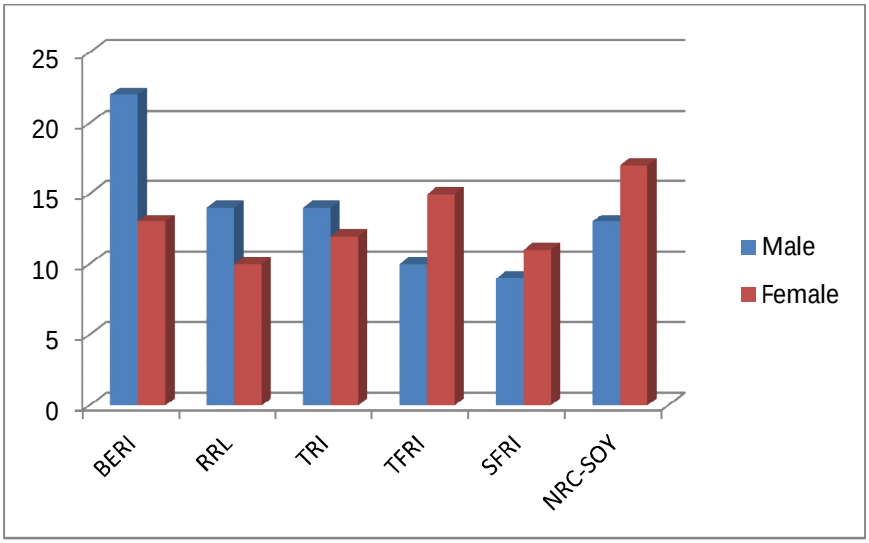
An attempt has been made to analyse the research data collected from students of selected research and development organizations libraries of M P and interpret the results, which provides valuable source of information to the research libraries of M P region and other underdeveloped regions in designing and developing a suitable strategy in promoting ICT based services for the better utilization of information sources in the libraries.

Gender wise Distribution

Table 1 shows that predominance of male with 51.25%, though percentage of female user is comparatively lower than male. Institution wise data analysis presents that both males and females are equally dominant in 3-3 institutes. Male users constitute 62.86% in BERI, 58.33% in RRL and 53.85% in TRI whereas females are predominant in TFRI, SFRI and NRC-SOY with 60.0%, 55.0% and 56.67% respectively.

Table 1: **Gender wise Distribution**

Sex	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Male	22 (62.86)	14 (58.33)	14 (53.85)	10 (40.0)	9 (45.0)	13 (43.33)	82 (51.25)
Female	13 (37.14)	10 (41.67)	12 (46.15)	15 (60.0)	11 (55.0)	17 (56.67)	78 (48.75)
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)



Distribution of Respondents Age-wise

In table 2 data analysis revealed that a higher proportion of users are in the age group of 25-30 years 40.0% followed by 30-40 years with 28.75% and 18-25 years 26.25% respectively. A less percentage of users belong to the age group 40-50 years and 50-60 years i.e. 2.5% respectively.

Table 2: **Distribution of Respondents Age-wise**

Age Group	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
18-25	8 (22.86)	5 (20.83)	10 (38.46)	7 (28.0)	5 (25.0)	7 (23.33)	42 (26.25)
25-30	12 (34.29)	9 (37.5)	8 (30.77)	12 (48.0)	8 (40.0)	15 (50.0)	64 (40.0)
30-40	13 (37.14)	6 (25.0)	8 (30.77)	6 (24.0)	7 (35.0)	6 (20.0)	46 (28.75)
40-50	2 (5.71)	-	-	-	-	2 (6.67)	4 (2.5)
50-60	-	4 (16.67)	-	-	-	-	4 (2.5)
Above 60	-	-	-	-	-	-	-
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)

Frequency of the Library Visits

Table 3 pertains the data regarding the frequency of library visit of the users which reveals that 37.5% users visit daily followed by 27.5% users visit as and when needed. Similarly 16.88% twice a week, 14.37% once a week, 1.87% once a month, 1.25% rarely and 0.63% fortnightly respectively.

Table 3: **Frequency of the Library Visits**

Frequency	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Daily	13 (37.14)	10 (41.67)	7 (26.92)	9 (36.0)	9 (45.0)	12 (40.0)	60 (37.5)
Twice a week	8 (22.86)	3 (12.5)	4 (15.38)	6 (24.0)	1 (5.0)	5 (16.67)	27 (16.88)
Once a Week	4 (11.43)	2 (8.33)	5 (19.23)	3 (12.0)	3 (15.0)	6 (20.0)	23 (14.37)
Fortnightly	-	1 (4.17)	-	-	-	-	1 (0.63)
Once a month	-	3 (12.5)	-	-	-	-	3 (1.87)
Rarely	-	-	-	-	-	2 (6.66)	2 (1.25)
As and when needed	10 (28.57)	5 (20.83)	10 (38.46)	7 (28.0)	7 (35.0)	5 (16.67)	44 (27.5)
Never	-	-	-	-	-	-	-
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)

Time Spent on Each Visit by Respondents

The data analysis according to table 4 shows that 73.75% respondents spent 0-1 hour in the library followed by 25.62% respondents 2-3 hours. On the other hand 0.63% respondents only spent on their each library visit.

Table 4: **Time Spent on Each Visit**

Time Spend	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
0-1 hour	28 (80.0)	19 (79.17)	22 (84.62)	19 (76.0)	8 (40.0)	22 (73.33)	118 (73.75)
2-3 hours	6 (17.14)	5 (20.83)	4 (15.38)	6 (24.0)	12 (60.0)	8 (26.67)	41 (25.62)
4-5 hours	1 (2.85)	-	-	-	-	-	1 (0.63)
6 hours and above	-	-	-	-	-	-	-
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)

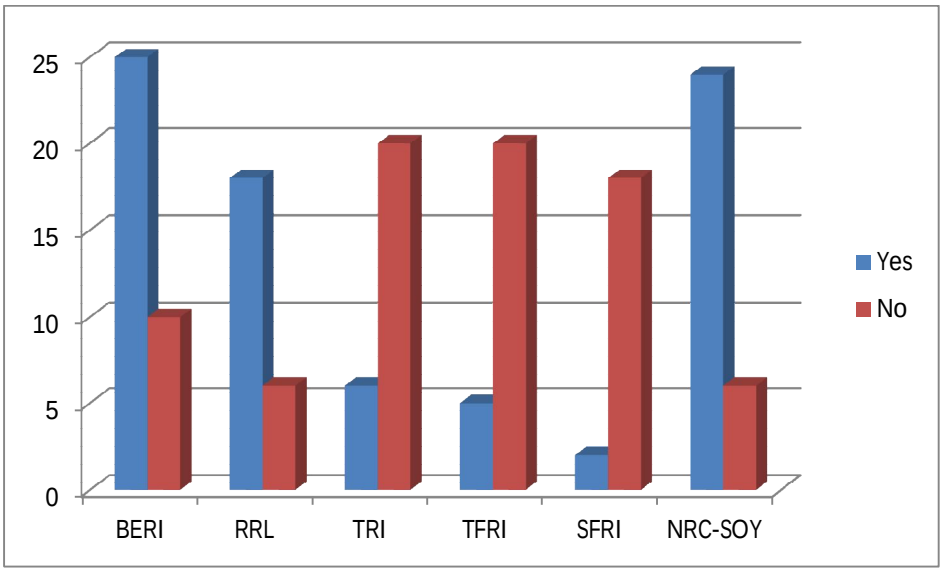
Institution wise analysis shows an overwhelming majority of users spent 0-1 hour in the library except SFRI where users reported 2-3 hours on their each visit.

Services with Application of ICT

Data analysis in the table 5 shows that 50.0% of respondents were of the opinion that their libraries provide ICT services. According to the table analysis of data presents that 80.0% NRC-SOY users followed by 75.0% RRL and 71.42% BERI users reported that there libraries are providing services with ICT application whereas 90.0% SFRI, 80.0% TFRI and 76.93% TRI users reported the unavailability for the same.

Table 5: **Services with Application of ICT**

Services with Application of ICT	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Yes	25 (71.42)	18 (75.0)	6 (23.07)	5 (20.0)	2 (10.0)	24 (80.0)	80 (50.0)
No	10 (28.57)	6 (25.0)	20 (76.93)	20 (80.0)	18 (90.0)	6 (20.0)	80 (50.0)
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)



The above analysis reveals that some organization like BERI, RRL and NRC-SOY are adopting ICT application to render services to the users whereas rest of the organizations are still following the traditional modes of services.

Place Prefer to Access ICT Services

In Table 6 reveals that 52.5% respondents prefer computer lab to access ICT services whereas 21.25% prefer department, 9.37% use library and cyber café and only 7.5% prefer home/ hostel respectively.

Table 6: **Place Prefer to Access ICT Services**

Place Prefer to Access ICT Services	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Department	7 (20.0)	2 (8.33)	6 (23.07)	7 (28.0)	5 (25.0)	7 (23.33)	34 (21.25)
Computer Lab	18 (51.42)	15 (62.5)	20 (76.92)	10 (40.0)	12 (60.0)	9 (30.0)	84 (52.5)
Library	2 (5.71)	1 (4.16)	-	4 (16.0)	-	8 (26.66)	15 (9.37)
Cyber Café	6 (17.14)	2 (8.33)	-	2 (8.0)	2 (10.0)	3 (10.0)	15 (9.37)
Home/ Hostel	2 (5.71)	4 (16.66)	-	2 (8.0)	1 (5.0)	3 (10.0)	12 (7.5)
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)

Individual data analysis depicts the same. Respondents of all the groups i.e. BERI 51.42%, RRL 62.5%, TRI 76.92%, TFRI 40.0%, SFRI 60.0%, NRC 30.0% preferred to access ICT services in the department. Data analysis shows that respondents of TRI either use department or computer lab as their preferred place. Lowest proportion of Respondents of SFRI i.e. 5.0% used home/ hostel whereas percentages of users are nil to use library in SFRI for the same.

The above analysis reveals that percentages of users to access ICT services in the library are very less as compared to other places.

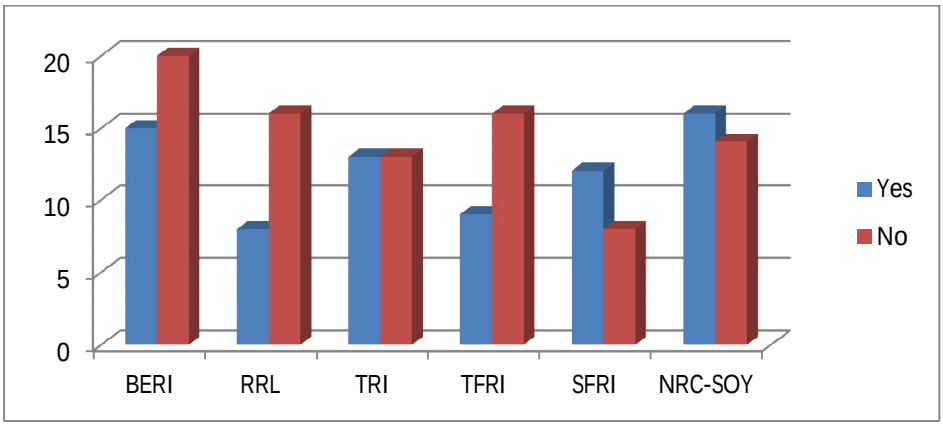
Problems in Accessing Information in ICT Environment

The analysis of data shows that a good proportion 54.37% of respondents reported that they don't have problem in accessing information in ICT environment. As per table 7 majority of respondents of BERI 57.14%, RRL 66.67%, TRI 50.0%, TFRI 64.0% don't have

problem with the same whereas SFRI 60.0%, NRC 53.33% and TRI 50.0% of respondents clearly mentioned that they face problem while accessing information in ICT environment.

Table 7: **Problems in Accessing Information in ICT Environment**

Problems in Accessing Information in ICT Environment	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Yes	15 (42.86)	8 (33.33)	13 (50.0)	9 (36.0)	12 (60.0)	16 (53.33)	73 (45.63)
No	20 (57.14)	16 (66.67)	13 (50.0)	16 (64.0)	8 (40.0)	14 (46.67)	87 (54.37)
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)



Reasons for not Using the ICT Services

From the above analysis it is clear that 46.63% users were facing problem in accessing information in ICT environment Some of them have reported some reasons for not using the ICT services which depicted in the table 8 which shows that 23.78% respondents were not using ICT services due to lack of infrastructure, 21.92% of respondents have lack of knowledge in browsing in digital resources, 17.8% of

respondents have problem with unfriendly attitude of library staff, 16.44% reported lack of training. Similarly 13.69% were not aware with digital resources, 2.73% of users lacks own timing, and also reported too much information is available, 1.36% claimed lack of quality information.

Table 8: **Reasons for not using the ICT Services**

Reasons for not Using the ICT Services	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Lack of infrastructure	-	-	3 (23.08)	6 (66.67)	4 (33.33)	4 (25.0)	17 (23.28)
Lack of training	3 (20.0)	-	2 (15.38)	-	3 (25.0)	4 (25.0)	12 (16.44)
Lack of your timing	-	-	-	-	-	2 (12.5)	2 (2.73)
Lack of knowledge in browsing in digital resources	7 (46.66)	4 (50.0)	-	3 (33.33)	-	2 (12.5)	16 (21.92)
Unfriendly attitude of library staff	5 (33.33)	1 (12.5)	4 (30.76)	-	3 (25.0)	-	13 (17.8)
Lack of quality information	-	-	-	-	-	1 (6.25)	1 (1.36)
Not aware about digital resources	-	3 (37.5)	4 (30.76)	-	2 (16.67)	1 (6.25)	10 (13.69)
Too much information is available	-	-	-	-	-	2 (12.5)	2 (2.73)
Time consuming	-	-	-	-	-	-	-
Downloading takes time	-	-	-	-	-	-	-
Slow net connection	-	-	-	-	-	-	-
Old PC / Number of PC are less	-	-	-	-	-	-	-
Total	15 (42.86)	8 (33.33)	13 (50.0)	9 (36.0)	12 (60.0)	16 (53.33)	73 (100.0)

As per table 46.66% and 50.0% of respondents in BERI and RRL recorded for lack of knowledge in browsing in digital resources whereas 30.76% in TRI reported for both unfriendly attitude of staff and not aware about digital resources. However 66.67% in TFRI and 33.33% in SFRI reported lack of infrastructure in their library and 25.0% in NRC-SOY reported for both lack of infrastructure and lack of training.

It is obvious from the above analysis the causes are different however effecting the services of the library and its users.

Access to Online Searching National and International Databases

Table 9 reveals 60.63% respondents are those who indicated that their libraries are provided with the facilities. However 39.37% reported unavailability of online searching of national and international databases in their libraries.

Table 9: **Access to Online Searching National and International Databases**

Online Searching of National and International Databases	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Yes	26 (74.28)	18 (75.0)	15 (57.69)	10 (40.0)	6 (30.0)	22 (73.33)	97 (60.63)
No	9 (25.71)	6 (25.0)	11 (42.31)	15 (60.0)	14 (70.0)	8 (26.67)	63 (39.37)
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)

Over 70.0% of respondents in BERI, RRL, NRC-SOY and 57.69% of TRI reported provision of online searching of national and international databases whereas 70.0% SFRI and 60.0% in TFRI reported unavailability for the same.

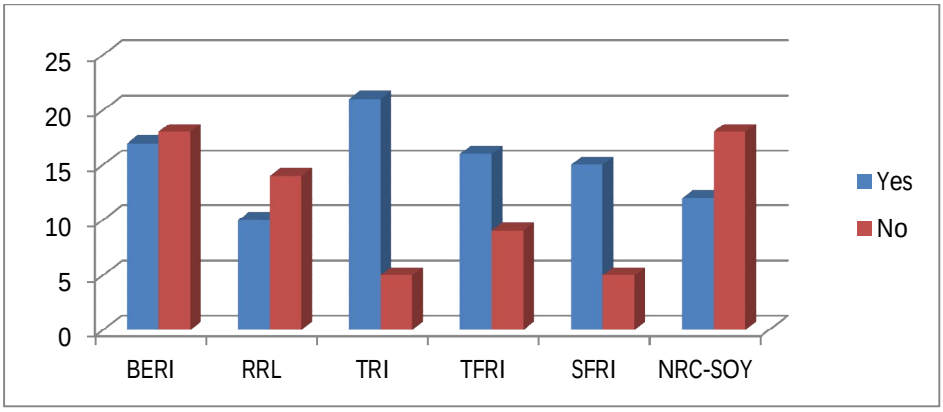
Need for User Education

Table 10 represents the comments recorded to find out the need for user education. Data analysis shows that 56.87% respondents reported for the need of user education.

Table 10: **Need for User Education**

Need for User Education	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Total
Yes	17 (48.57)	10 (41.66)	21 (80.77)	16 (64.0)	15 (75.0)	12 (40.0)	91 (56.87)
No	18 (51.42)	14 (58.33)	5 (19.23)	9 (36.0)	5 (25.0)	18 (60.0)	69 (43.13)
Total	35 (21.88)	24 (15.0)	26 (16.25)	25 (15.63)	20 (12.5)	30 (18.75)	160 (100.0)

80.77% TRI, 75.0% SFRI, 64.0% TFRI respondents expressed the need for user education whereas 60.0% NRC-SOY, 58.33% RRL and 51.42% BERI are not in the favour of user education.



Need for Formal Training

Table 11 depicts clearly about the users who needed formal training and the areas in which they need training. Table 11 presents that 21.97% of respondents were needed training in search query formulation followed by 18.68% of respondents needed in advance searching and data mining from digital library.

Table 11: **Need for Formal Training**

Areas/ Levels of Formal Training	BERI	RRL	TRI	TFRI	SFRI	NRC-SOY	Row Total
Fundamentals of computer	-	-	3 (14.28)	2 (12.5)	3 (20.0)	1 (8.33)	9 (9.89)
Database searching	2 (11.76)	2 (20.0)	2 (9.52)	3 (18.75)	3 (20.0)	1 (8.33)	13 (14.28)
Internet based information resources and services	-	1 (10.0)	2 (9.52)	4 (25.0)	1 (6.66)	1 (8.33)	9 (9.89)
Advance searching	4 (23.52)	2 (20.0)	4 (19.04)	5 (31.25)	1 (6.66)	1 (8.33)	17 (18.68)
Search query formulation	3 (17.64)	2 (20.0)	6 (28.57)	3 (18.75)	3 (20.0)	3 (25.0)	20 (21.97)
Data mining from digital library	4 (23.52)	3 (30.0)	2 (9.52)	3 (18.75)	2 (13.33)	3 (25.0)	17 (18.68)
OPAC training	4 (23.52)	-	2 (9.52)	1 (6.25)	2 (13.33)	2 (16.66)	11 (12.08)
Total	17 (48.57)	10 (41.66)	21 (80.77)	16 (64.0)	15 (75.0)	12 (40.0)	91 (56.87)

Data analysis of each group reveals that 23.52% of respondents in BERI needed training in three areas namely- advance searching, data mining from digital library and OPAC training. 30.0% in RRL mentioned there need in data mining, 28.57% TRI respondents are curious to have training in search query formulation, 31.25% TFRI respondents need

to train in advance searching, 20.0% SFRI respondents needed training in fundamentals of computers, Database searching and search query formulation and 25.0% NRC-SOY respondents needed training in search query formulation and data mining.

Conclusion and Findings

Presently libraries are changing very fast and continuously by ICT based services and product. Research and development libraries of M.P. need more attention towards modernization and adoption of ICT based services and resources. Thus the world is stepping forward with the development of ICT and change is enforced by ICT. On the basis of data analysis, the study highlighted and puts forth important findings as-

- The majorities of the respondents visits the library daily and are in habit of using the library for 0-1 hour.
- The analysis revealed that female respondents visit the library maximum.
- The institution wise analysis revealed that Tribal Research Institute (Bhopal), Tropical Forest Research Institute (Jabalpur) and State Forest Research Institute (Jabalpur) lacking ICT application in their libraries whereas majority of respondents indicates that other three libraries of M.P. are providing services with ICT application.
- The study indicates that majority of respondents prefer computer labs to access ICT services.

- It has been found that the majority of users indicated that their libraries have the provision of online searching of national and international databases.
- The analysis revealed that majority of users stated lack of infrastructure as the reason for not using the ICT service in library.
- The study revealed that the users of M.P. expressed the need of user education. Of those who responded for user education, the majority of users 21.97% of users in M.P. needed training in search query formulation.

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