Pattern of Information use by Researchers in Library and Information Science

Dr. Vaishali Khaparde
Associate Professor and Head
Dept of Library and Information Science
Dr Babasaheb Ambedkar Marathwada University
Aurangabad (Maharashtra) India

ABSTRACT

The present study attempts on the pattern of information use by researcher in the field of library and information science. It is based on the references appended to International Journal of "Library Hi Tech" during 2005-2009. The present study is based on 3876 references appended to 247 articles contributed by the authors in Library Hi Tech. It was found that Journals Citations are more in number the other citations. In Authorship pattern it was found that Solo Research is Predominant than Collaborative Research. The degree of research collaboration was calculated and it was found that the single authorship trend increased gradually in Library Hi Tech. .It was seen that researchers cite latest documents. Universities are the major contributors. The study shows the half life period of Library Hi Tech literature is 24 years approximately.

Introduction

Bibliometrics is a quantitative study of the literature on a topic and is used to identify pattern of publication, authorship, and secondary journal coverage to get an insight into the growth of knowledge on that topic. Bibliometrics has attained a sophistication and complexity, and has national, international and interdisciplinary character. The term "Bibliometrics" was coined by Pritchard in 1969, and its practice can be traced back to the second decade of the 20th century. Bibliometrics has been known by other names, including "Statistical analysis of the literature" (Cole and Eales, 1917), while Hulme used the term "Statistical bibliography" in 1923. (Thanuskodis, 2010) Bibliometrics is described essentially a quantitative analysis of publications for the purpose of ascertaining specific kinds of phenomena (Herubel, 1999). It encompasses the measurement of properties of documents, and document related processes. (Borgman and Femer, 2002). It uses mathematical and statistical methods to analyses and measure the output of scientific publications

Citation analysis

Citation analysis examines the frequency, patterns and graphs of citations in articles and books (Garfield, 1983)

E- Journal

E – Journal is defined as the grouping of information that is sent out in electronic form with some equalarity. It covers any serial or serial like publication available in published and distributed electronically (Ramesh and Yeramagula, 2003); such published using the World Wide Web (Gupta, 1998).

Selected E- Journal
Library Hi Tech

Library Hi Tech is an International E- Journal. It is published quarterly. Library Hi Tech journal is published from United Kingdom. Library Hi Tech is a double-blind peer-reviewed academic journal on computing and technology for the library community. It is international in scope, and defines technology in the broadest possible terms to include the full range of tools that librarians and their customers employ. Research articles about new technologies or new uses of technologies are particularly welcomed. Case studies and scholarly literature reviews are also accepted.

Library Hi Tech is available as part of an online subscription to the Emerald Library and Information Studies Subject Collection.

Objectives of the Study

1) To identify the number of references per article.
2) To know the form wise distributions of references.
3) To understand the nature of authorship pattern of references per   article

   4) To identify the year - wise degree of collaboration
   5) To know about the organization wise contribution of articles.
   6) To find out the country wise distribution of cited references.
   7) To identify the ranking of the journals
   8) To find out the chronological distribution of citations
   9) To study the obsolescence/ageing of literature in the library hi   tech
  10) To find out the web references and print references
  11) To find out the lengths of articles

Scope and Limitation:

The present study attempts on the pattern of information use by researcher in the field of library and information science. It is based on the references appended to International Journal of "Library Hi Tech". During 2005-2009. The present study is based on 3876 references appended in 247 articles contributed by the authors in Library Hi Tech.

Data Collection

In present study the front page of the articles and citations were collected from the end of the articles of each issue of journal by doing photocopies of citations and from these photocopies the information was collected and analyzed.

Data Analysis

Analysis of 3876 references appended in 247 articles was done by using various parameters laid down in objectives. Analysis was done in tabular and graphical form.

   1   Average number of references per articles.
   2   Form wise distribution of references.
   3   Authorship pattern of references.
   4   Year - wise Degree of Collaboration.
   5   Organizational contribution of articles.
   6   Country wise distribution of references.
   7   Ranking of the journals.
   8   Chronological distribution of citations.
   9   Obsolescence/ageing of literature in the library hi   tech
  10   Web references and print references
  11   Lengths of articles

1) Average number of references per articles is shown in Table No. 1

Table 1: Average number of references per articles

Year	Volume No	No.of Article	No.of References	Percentage
2005	*23* (1-4)	49	330	6.74
2006	24 (1-4)	50	721	14.42
2007	25 (1-4)	49	1014	20.69
2008	26 (1-4)	51	956	18.75
2009	27 (1-4)	48	855	17.81
Total		247	3876	15.69

Table 1 represent the average number of references per article during 2005, 2006, 2007, 2008 and 2009. The highest number of references per article, is observed in 2007 i.e. 1014 (20.69), Observered in the year 2005 lowest number of references per article i.e. 330 (6.74) were.

**Fig. No.1: Average number of references per article**
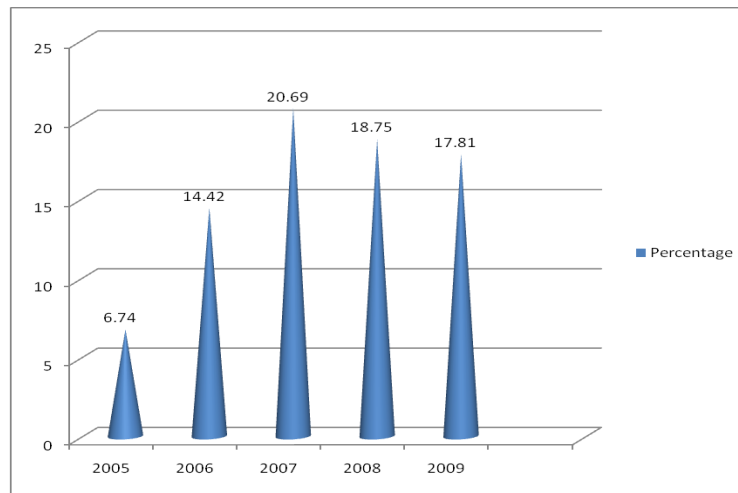
2) **Form wise Distribution of references:** is shown in Table No. 2 Journals, Books, Thesis, Handbooks, Symposia, Reports, Conference proceeding, Seminars, Manuals, Newsletters, Standards, Magazine and other forms of documents cited in the journal are shown in table no. 2. The study regarding the Form- wise distributions of citations has been done in order to know the most dominant forms in which the information is cited.

Table no. 2: Form wise Distribution of references

Sr. No	Form	2005	2006	2007	2008	2009	Total no of reference	Cumulative Citation	Percentage	Cumulative Percentage
1	Journal	140	288	249	337	308	1322	1322	34.11	34.11
2	Book	61	97	261	114	70	603	1925	15.56	49.66
3	Thesis	1	8	6	19	7	41	1966	1.06	50.72
4	Handbook	1	13	2	5	2	23	1989	0.59	51.32
5	Symposia	-	-	3	-	-	3	1992	0.08	51.39
6	Report	15	31	27	33	37	143	2135	3.69	55.08
7	Conference Proceeding	19	28	39	46	63	195	2330	5.03	60.11
8	Seminars	6	15	8	12	21	62	2392	1.60	61.71
9	Manual	1	1	1	4	8	15	2407	0.39	62.10
10	Bulletin	5	8	4	6	3	26	2433	0.67	62.77
11	Review	1	18	27	12	7	65	2498	1.68	64.45
12	Newsletter	9	15	17	14	12	67	2565	1.73	66.18
13	Archives	8	17	14	30	6	75	2640	1.93	68.11
14	Standards	4	4	13	1	8	30	2670	0.77	68.89
15	Magazine	6	14	18	15	12	65	2735	1.68	70.56
16	Others	53	164	325	308	291	1141	3876	29.44	100.00
	Total	330	721	1014	956	855	3876			

Table 2 gives form- wise distribution of citation analysis and shows that of the total 3876 citations 1322 Citations are journals citations. It forms about 34.11% of the total. This is followed by other forms such as books 15.56%, Conference proceedings 5.03%, Archives 1.93% and any others forms i.e. 29.44% respectively. Where hypothesis No. 1 is proved **"Journals Citations are more in number the other citations"**.

**Fig. No.2: Form wise distribution of references**
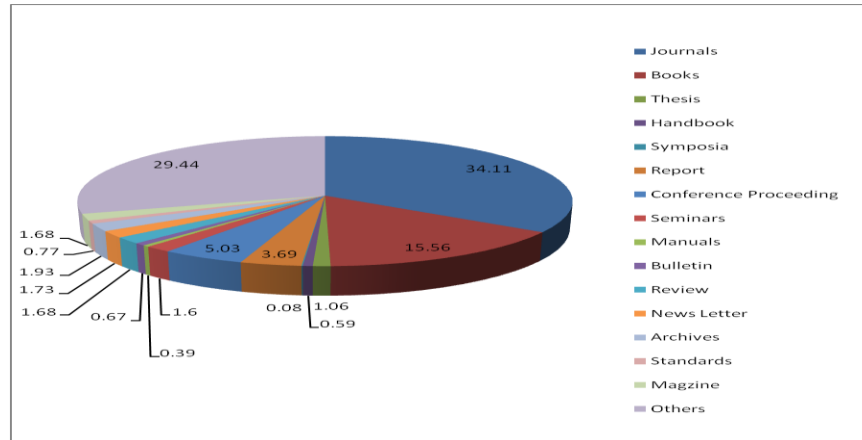
3) Authorship pattern: The authorship pattern has been studied with 247 articles. It was analyzed to determine single, two, three, four, five, six or more than six authors which is shown in Table No. 3.

Table 3: Authorship pattern

Authorship	2005	2006	2007	2008	2009	Total percentage
Single	222 67.27	447 62.00	804 79.29	637 66.63	526 61.52	2636 68.01
Two	59 17.88	175 24.27	135 13.4	191 19.98	161 18.83	721 18.60
Three	31 9.39	53 7.35	39 3.85	83 8.68	79 9.24	285 7.35
Four	11 3.33	18 2.50	25 2.47	33 3.45	42 4.91	129 3.33
Five	2 0.61	13 1.80	6 0.59	7 0.73	15 1.75	43 1.11
Six	3 0.91	5 0.69	4 0.39	3 0.4	5 0.59	20 0.5
More than Six	2 0.61	10 1.39	1 0.10	2 0.21	27 3.16	42 1.08
Total	330 8.51	721 18.60	1014 26.16	956 24.67	855 22.06	3876 100

Table 3 identifies the distribution of articles according to the number of contributors. The number of single authors is highest and it accounts for 2636 (68.01%) and the number of six authors is the lowest and it accounts for 20 (0.5%) and more than six authors accounts 42 (1.08). Where **Solo Research is Predominant than Collaborative Research**

Fig. No. 3: Authorship Pattern
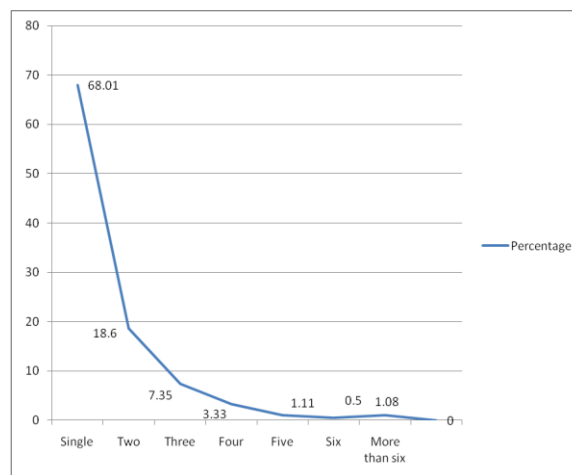
4) Degree of Author's Collaboration: is shown in Table no. 4

Various method have been proposed to calculate the degree of research collaboration. Here, in this study the formula proposed by Subramanyam (1983) has been used.

The degree of collaboration C=

$$C = \frac{Nm}{Nm + Ns}$$

Where, C= Degree of collaboration in a discipline

Nm = number of multi- authored papers in the discipline

Ns= number of single- authored paper in the discipline

Here, Nm = 1240

Ns = 2636

$$C = \frac{1240}{1240 + 2636} = 2.13$$ Thus the degree of collaboration (C) 2.13.

So, in the study the degree of collaboration during the overall 5 years (2005- 2009) is 2.13.

Table 4: Year – Wise Degree of Collaboration

Year	Total No. of Articles	Total No. of Authors	No. of Single Author	% of Articles	No. of Multi Authored Articles	% of Articles	Degree of Collaboration
2005	330	526	222	5.73	108	2.79	0.33
2006	721	1201	447	11.53	274	7.07	0.38
2007	1014	1259	804	20.74	210	5.42	0.21
2008	956	1481	637	16.43	319	8.23	0.33
2009	855	1560	526	13.57	329	8.49	0.38
Total	3876	6027	2636	68.01	1240	31.99	0.33(mean)

Table 4 shows that in the 5 years of period, the single authorship articles are higher and predominant than multi authorship. The multi authored articles are highest in year 2009 i.e. 329 (8.49). The Single authored articles 804 (20.74) are highest in the year 2007. It is seen that the single authorship trend is increasing gradually in Library Hi Tech.

5) Organizational Contributions of Articles:

Universities are the major contributors with 191 (77.33) contributions from 2005-2009 (vol. 23-27) and also followed by research institute with 56 (22.67) contribution. Where. **"Universities are the major contributors".**

Fig .No.4: Organizational Contributions of Articles
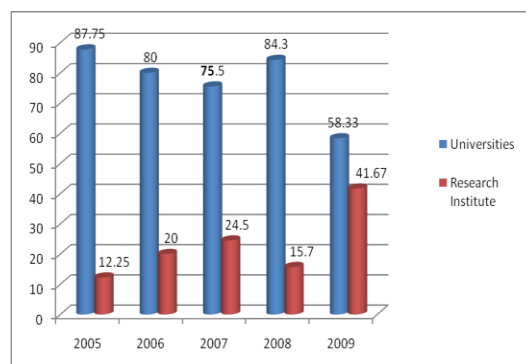
1) **Country wise distribution of references:** The countries on the basis of number of citations published are shown in table 6

Table 6: Country wise distribution of references

Country wise	2005	2006	2007	2008	2009	Total
USA	57 16.36	79 10.96	157 15.48	184 19.25	119 13.91	596 15.38
India	1 0.30	-	13 1.28	12 1.25	6 0.70	32 0.83
London	7 2.12	39 5.41	16 1.58	23 2.41	39 4.56	124 3.20
Canada	20 6.06	29 4.02	37 3.65	25 2.61	37 4.33	148 3.81
Germany	6 1.82	19 2.63	10 0.99	12 1.25	18 2.11	65 1.68
Australia	-	4 0.56	4 0.39	4 0.41	-	12 0.31
Chicago	3 0.91	4 0.56	12 1.18	13 1.36	5 0.59	37 0.96
Portland	1 0.30	1 0.14	-	-	2 0.23	4 0.10
Beijing	-	-	2 0.20	-	1 0.11	3 0.08
Africa	7 2.12	2 0.28	1 0.10	-	1 0.11	11 0.28
Europe	-	1 0.14	-	-	2 0.23	3 0.08
Switzerland	-	1 0.14	-	-	1 0.11	2 0.05
Italy	-	1 0.14	-	1 0.11	-	2 0.05
Netherland	-	-	-	1 0.11	-	1 0.03
Saudi Arabia	-	1 0.14	-	-	-	1 0.03
Ireland	-	4 0.56	1 0.10	5 0.52	2 0.23	12 0.31
Greece	-	-	1 0.10	2 0.21	-	3 0.08
Iran	-	-	4 0.39	5 0.52	10 1.17	19 0.49
Egypt	1 0.30	-	1 0.10	-	-	2 0.05
Taiwan	-	-	-	1 0.11	-	1 0.03
Places are not mentioned	227 68.79	536 74.34	755 74.46	668 69.87	612 71.58	2798 72.19
Total	330	721	1014	956	855	3876 100

The countries having a maximum number of 3876 citations appended in 247 articles have been considered. The study regarding the country wise distributions of citations has been done in order to know the most dominant countries in which the information is cited. Table reveals that USA, India, London, Canada, Germany have 596 (15.38%), 32 (0.83), 124 (3.20%), 148 (3.81%), 65 (1.68%). However in 2798 citations the place of publication is not mentioned.

7) **Ranked List of Most Cited Journals:** The Journal Citations were further analyzed to establish a list of Journals. Table 7 provide ranked list of the top most frequently cited journals under study.

Table 7: Ranked List of Most Cited Journals

Sr No	Rank No	Name of the Journal	No. of Citation	%
1	1	Library Hi Tech	103	7.79
2	2	Library Journal	58	4.39
3	3	Journal of the American society for information science and Technology	42	3.18
4	4	Computers in Libraries	40	3.03
5	5	Journal of Academic Librarian -ship	35	2.65
6	6	Information Technology and Libraries	31	2.34
7	7	Information processing and Management	25	1.89
8	8	Online	24	1.81
9	9	Library Trends	22	1.66
10	10	Library and Information science research	21	1.59
11	11	Journal of Information Science	20	1.5
12	11	The Electronic Library	20	1.5
13	11	Health Information and Libraries Journal	20	1.5
14	12	College and Research Libraries	18	1.36
15	13	Journal of Documentation	17	1.29
16	13	Internet Reference Services Quarterly	17	1.29
17	14	Ariadne online Journal	16	1.21
18	15	Library Management	15	1.13
19	15	The Serials Librarian	15	1.13
20	16	Cataloging and Classification Quarterly	14	1.05
21	16	Library Collection, Acquisitions and Technical Services	14	1.05
22	16	Serials Review	14	1.05
23	16	Searcher	14	1.05
24	17	First Monday	13	0.98
25	17	The Library Quarterly	13	0.98
26	18	Online Information Review	12	0.90
27	18	Communication of the ACM	12	0.90
28	18	New Library World	12	0.90
29	19	Information Outlook	10	0.75
30	19	OCLC System and Services	10	0.75
31	19	Journal of Medical Library Association	10	0.75
32	20	Library Hi Tech News	9	0.68
33	20	The Reference Librarian	9	0.68
34	20	Library Resources and Technical Services	9	0.68
35	20	Library Review	9	0.68
36	20	Reference and User Services Quarterly	9	0.68
37	20	American Libraries	9	0.68
38	21	Reference Services Review	8	0.61
39	22	Feliciter	7	0.53
40	22	Scientometrics	7	0.53
41	22	Medical Reference Services Quarterly	7	0.53
42	22	The Chronicle of Higher Education	7	0.59
43	23	Science and Technology Libraries	6	0.45
44	23	Information Today	6	0.45
45	23	IEEE Transactions on Pattern Analysis and Machine Intelligence	6	0.45
46	23	Libri	6	0.45
47	23	Journal of Librarianship and Information Science	6	0.45
48	23	Zeitschrift fur Bibliothekswesen and Bibliographie	6	0.45

49	24	Journal of Digital Information	5	0.38	
50	24	Journal of Library Administration	5	0.38	
51	24	The International Information and Library Review	5	0.38	
52	25	Pattern Recognition	4	0.30	
53	25	Information Service and Use	4	0.30	
54	25	EContent	4	0.30	
55	25	Technical Service Quarterly	4	0.30	
56	25	Webology	4	0.30	
57	25	Aslib Proceeding	4	0.30	
58	25	Health Libraries Review	4	0.30	
59	25	Annals of Internal Medicine	4	0.30	
60	25	Journal of American Medical Informatics Association	4	0.30	
61	25	Library Association Record	4	0.30	
62	25	Nature	4	0.30	
63	26	Public Libraries	3	0.23	
64	26	Program: Electronic Library and Information Systems	3	0.23	
65	26	Mississippi Libraries	3	0.23	
66	26	Bibliothek forschung and praxis	3	0.23	
67	26	The Journal of Information and Knowledge Management Systems	3	0.23	
68	26	The Bottom Line	3	0.23	
69	26	Collection Management	3	0.23	
70	26	Canadian Medical Association Journal	3	0.23	
71	26	Molecular Systems Biology	3	0.23	
72	26	BMC Bioinformatics	3	0.23	
73	26	ACM SIGIR Forum	3	0.23	
74	26	Portal Libraries and The Academy	3	0.23	
75	27	44 Journals With 2 Citations	88	6.66	
76	28	331 Journals With 1 Citations	331	25.03	
			1322	100	

It was observed that the Library Hi Tech journal ranked 1st in position than the other journals with maximum number of citations i.e. 103 (7.79%). 44 journals with 2 citations and 331 journals with 1 citation respectively.

8)The Chronological Distribution of Citations: is shown in Table no 8

Table 8: Chronological Distribution of Citations

Period	Number of Citations	Cumulative Citations	Percentage of Citations	Cumulative % of Citations
1900& Before	4	4	0.10	0.10
1901-1910	1	5	0.03	0.13
1911-1920	1	6	0.03	0.16
1921-1930	4	10	0.10	0.26
1931-1940	7	17	0.18	0.44
1941-1950	7	24	0.18	0.62
1951-1960	19	43	0.49	1.11
1961-1970	23	66	0.59	1.70
1971-1980	61	127	1.57	3.27
1981-1990	123	250	3.17	6.44
1991-2000	692	942	17.85	24.29
2001-2010	2911	3853	75.10	99.39
Unidentified	23	3876	0.59	100.00
Total	3876			

The study regarding the Ranking of the year-wise citations has been done in order to know the most dominant year; the ten year span of period was undertaken for study. Table 8 gives Ranking of year of distribution of citation which shows that 2911 the highest number of Citations out of a total of 3876 Citations is in year 2001-2010 and lowest number of citation in year 1901-1910 and 1911-1920 respectively. Where it is seen that the researchers cite the latest document. The study also shows that last 18-20 years (1991-2010) literature was cited highest.

9) *Obsolescence of Library Hi Tech Literature*

Citation analysis techniques are becoming more popular to study the characteristics of literature of a subject. Half-life and other obsolescence studies help the working librarians and information scientists in deciding which item to keep and which item to store or discard in order to maintain the need based and moderate collections in libraries. Obsolescence has been defined as the "decline over time in validity or utility of information". It has found to vary from one subject to another and from one country to another, depending on the factors such as the nature and characteristics of subjects etc. It has been found that a large number of obsolescence studies have been reported in the field of science and technology than in social sciences and the humanities.

Obsolescence of Library Hi Tech: is shown in Table No. 9

Table 9: Obsolescence of Library Hi Tech

Age in Years	Citations	Cumulative Citation	Percentage	Cumulative Percentage
0-5	4	4	0.10	0.10
6-10	1	5	0.02	0.12
11-15	-	-	-	-
16-20	1	6	0.02	0.14
21-25	-	-	-	-
26-30	2	8	0.05	0.19
31-35	2	10	0.05	0.24
36-40	3	13	0.08	0.32
41-45	4	17	0.10	0.42
46-50	2	19	0.05	0.47
51-55	5	24	0.13	0.60
56-60	4	28	0.10	0.70
61-65	15	43	0.39	1.09
66-70	8	51	0.21	1.30
71-75	15	66	0.39	1.69
76-80	24	90	0.62	2.31
81-85	37	127	0.96	3.27
86-90	43	170	1.11	4.38
91-95	80	250	2.06	6.44
96-100	220	470	5.68	12.12
101-105	472	942	12.18	24.30
106-110	1403	2345	36.20	60.50
111 and above	1508	3853	38.91	99.41
Unidentified	23	3876	0.59	100.00
Total	3876		100.00	

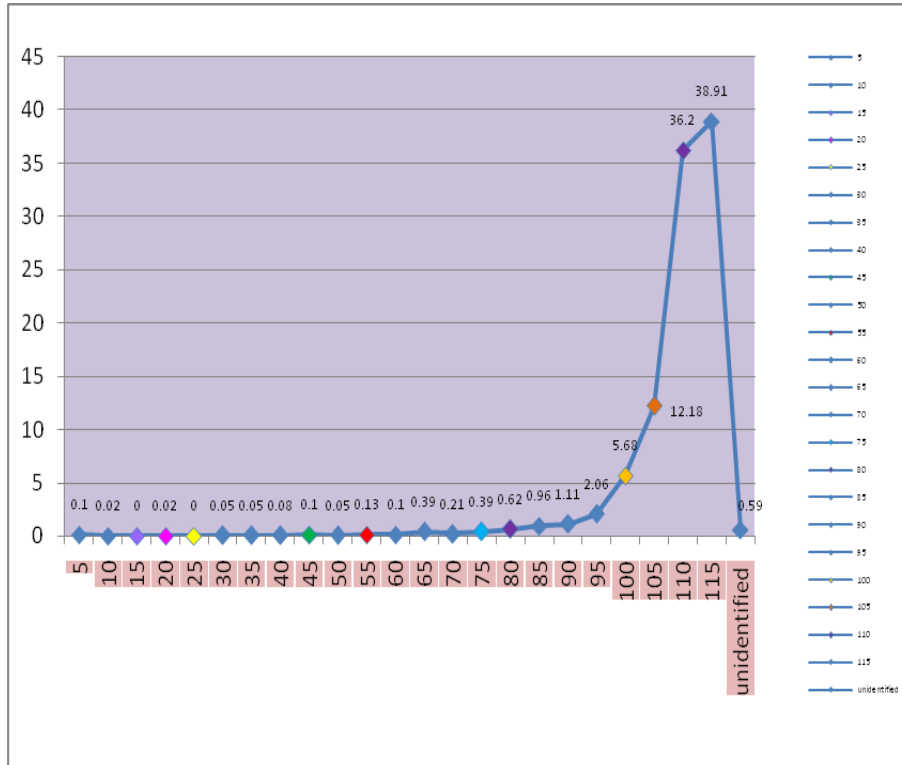**Fig. No.5: Obsolescence of Library Hi Tech**

Table 9 represents the obsolescence rate of literature. It can be assessed by citation analysis which can give an indication of how far a researcher must go back to obtain a representative sample of the published literature in a given field. The present study made an attempt to determine the half life period of Library Hi Tech literature which will help the librarians in building need based collection. To calculate the half life period of Library Hi Tech literature in the present study, a graph is plotted in fig. 5 based on the data given in the table 6 of obsolescence of Library Hi Tech literature from the period of years at the cumulative number of five years on x-axis a and cumulative number of citations on the Y-axis. A parallel line from Y-axis is drawn from the point "P" (representing the half the number of total citations). To meet the curve at point "Q", a perpendicular QR is drawn to the X- axis. The line "OP" represents the half of the total 3876 citations i.e. 1938 and the line "QR" represent the half life period for Library Hi Tech literature, which falls on an average for 24 years. The study shows the half life period of Library Hi Tech literature is 24 years approximately.

10) Year –wise Percentage of Articles having Web references and print references: is shown in Table No. 10

Table 10

Year –wise Percentage of Articles having Web references and print references

Year	Total Number of Articles	Total Number of Articles with web references	Total Number of references	Total Number of web references	Total Number of Print Journal references
2005	49	45 91.84	330	115 34.85	215 65.15
2006	50	43 86.00	721	249 34.53	472 65.46
2007	49	42 85.71	1014	273 26.92	741 73.08
2008	51	45 88.23	956	314 32.85	642 67.15
2009	48	40 83.33	855	256 29.94	599 70.06
Total	247	215 87.05	3876	1207 31.14	2669 68.86

From the table no. 10 it can be seen that total 3876 references are appended to 247 articles, out of which 1207(31.14) are web references and 2669(68.86) are print references of which maximum web references are in the year 2008i.e. 314(32.85) appended to 51 articles. Whereas maximum print references are in the year 2007 i.e. 741 (73.08) appended to 49 articles.

**Fig. No.6: Year – wise Percentage of Articles having Web references and Print references**
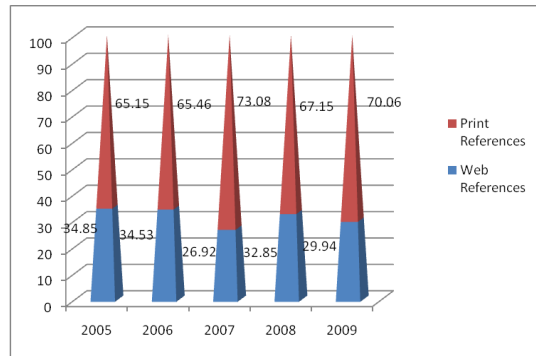
11) Length of Articles: Table 11 indicates the details about the page length of the contributions

Table – 11 Length of Articles

No of Pages	2005	2006	2007	2008	2009	Total	Percentage
1-5	5	5	4	6	5	25	10.12
6-10	17	23	15	12	18	85	34.41
11-15	19	16	19	22	16	92	37.25
16-20	6	4	9	9	7	35	14.17
21-25	1	1	2	2	2	8	3.24
26-30	1	--	--	--	--	1	0.40
31-35	--	1	--	--	--	1	0.40
Total	49	50	49	51	48	247	100

Out of 247 contributions 25 contributions (10.12) have page length of 1-5 pages while 92 contributions (37.25) have length of 11-15 pages. There are two contributions that has page length between 26-30 and 31-35 pages i.e. (0.40) respectively.

Fig. No.7: Length of Article
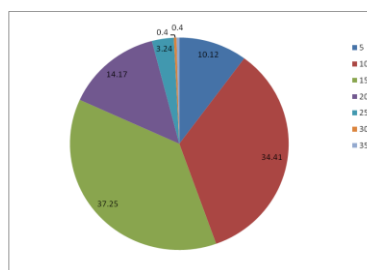
Findings and conclusion

The findings are based on the analysis of collected data appended in   247articles and 3876 references in Library Hi Tech e-journals.

1 . **Journals Citations are more in number the other citations".**
2 . **Single authors are more in number than co-authors".**
3.   The single authorship articles are higher and predominant than multi authorship. The multi authored articles are highest in year 2009 i.e. 329 (8.49). The Single authored articles 804 (20.74) are highest in the year 2007. It is seen that the single authorship trend is increasing gradually in Library Hi Tech.
4.   Universities are the major contributors with (77.33) from 2005-2009 (vol. 23-27) and also followed by research institute with (22.67) contribution. Where **Universities are the major contributors.**

5   The Journal Citations were further analyzed to establish a list of Journals. most frequently cited. It was observed that the Library Hi Tech journal ranked 1ˢᵗ in position than the other journals with maximum number of citations i.e. 103 (7.79%).

6.   The study regarding the Ranking of the year of citations has been done in order to know the most dominant year .The ten year span of period was taken. It was seen that highest number of Citations were in the year 2001-2010 and lowest number of citation in the year 1901-1910 and 1911-1920 respectively. Where it is seen that the researchers cite the latest document. The study showed that last 18-20 years (1991-2010) literature was cited highest.

7.   The study shows the half life period of Library Hi Tech literature is 24 years approximately.

8 .   Out of 247 Contributions. 25 contributions (10.12) have page length of 1-5 pages while 92 contributions (37.25) have length of 11-15 pages. There are two contributions that has page length between 26-30 and 31-35 pages i.e. (0.40) respectively.

4.2 Conclusion

Citation analysis is a branch of bibliometrics where the unit of analysis is a document that is being cited as a bibliographic reference. It is the study of the distribution or scattering of references. Citation studies do provide some guide lines for the librarians and information scientist in the decision making process in their acquisition policy. These finding are much helpful for librarians and information scientists while talking decisions regarding collection development, removing out dated documents from the shelves and also in maintaining need based collection in the libraries

References

1.   Burton, H (1988); Use of a virtual information system for biblimoetric analysis. Information processing and management 24 (1); 39-44.

2.   Brokes, B.C. (1977); Theory of Bradford's Law. Journal of documentation 27 (5); 292-306.

3.   Bookstein, A (1979); Explanation of bibliometric laws. Collection management 3; 151-162.

4.   Broadus, R.N. (1987); Definition of bibliometrics, scientometrics 12; 373-398.

5.   Braun, T (1991): The bibliometric assessment of UK scientific performance. In scientometics 20; 359-362

6.   Cheng, H (1996): A bibliometric study of library and information research in china. IFLA General conference.62

7.   Choon, S (2009): Bibliometric malysis of the Korean journal of parasitology; measured from SCI, pubmed, scopus, and sgan pre Databases Korean journal parasitol 47; 1-14.

8.   Denniel, R.S (1979) Bibliometrics and Scholorly impact. American psychologist 34 (8); 180-209.

9.   Egghe, L; methodological aspects of biblimetrics. Library science with a slaut to documentation 25; 179-199.

10.   Egghe, L (1964); methodological aspects of bibliometrics. Library science 143; 882-884.

11.   Ferrante, Barbara (1978): Bibliometrics: access in the library literature. Collection management 2 (3); 199-204.

12.   Garg, K.C. (1992): Bibliometrics of aricultural research in India. Quarterly bullectin of the international association of agricultural information specialists 37 (3); 133-137.

13.   Glanzel, W(2003): Bibliometrics as a research field: A course on theory and application of biblimetric indicators.

14.   Henk, F (2002): Journal impact measures in bibliometric research. Published by Akademiai Kiado, Budapest and Kluwer Academic publishers 53 (2); 171-193.

15.   Hjreppe, R (1980): A Bibliography of bibliometrics and citation indexing and analysis. Stockholm Royal institute technology library.

16.   Jesper, W (2004): introduction to bibliometrics for. Construction and maintenance of thesauri. Journal of Documentation 60 (5); 524-549.

17.   Kopelock, B (1978): Bibliomertrics: Access in the library literature. Collection management 2 (3); 348.

18. Kumar, S (2006): Library and information science research in India: A Bibliometric study. Annals of library and information studies 53; 219-223.

19. Kim, H (2008): Subject support in collection developments using the bibliometric tool. Collection Building 27 (4); 157-166

20. Lancaster, F.M. (1991): Bibliometric methods in assessing productivity and impact of research. Bangalore Sarada Ranganathan Endowment for library science.

21. Nicholas, D (1978): Literature on bibliiometrics. London, Bingleu.

22. Pirtchard, Alan (1969): statistical bibliography or biblimetrics. Journal of Documentation 25; 348-349.

23. Price, D. (1976); A general theory of bibliometrics and other cumulative advantage process. Journal of American society for information Science? 27 (5); 292-306.

24. Potter, W.G. (1981); introduction to biblimeetrics Library trends 30; 5.

25. Pritchard, Alan and witting (1960): Biliometrcs: A bibliography and index.

26. Ravichandar Rao (1988): in Workshop on scientific communication and bibliometrics. Calcutta.

27. Rousseau, R. (1990): Relations between continous version of biblimetric laws. Journal of the American society for information science 41; 197-203.

28. Sengupta I.N (1988): Bibliometric research: gsowth of biomedical literature. Calcutta: SBA publication (1).

29. Solla price, D (1976): Ageneral theory of bibliometrics and other cumulative advantage process. Journal of American society for information science 27 (5); 292-306.

30. Schrader, Alvin M (1981): Teaching bibliometrcs. Library trends 30; 151

31. Sen, B.K. (1992); Evalution of recent scientific research output by a bibliometric method. In scientometrics 23(1); 21-30.

32. Subramanyan, K (1993): Bibliometric studies as research collaboration; a review. Journal of information science 6; 35.

33. Sengupta, I (1990): Biblimetriccs and identification of core periodicals. Herald of library science 29 (3-4); 226-247.

34. Subramanyam, K. (1983): Bibliometric studies of research collaboration. Journal of information sciences; 33-38.

35. Sengupta, I.N. (1990) bibliometrics and its applications. In information science and libraries. New delhi, atlantic; 256.

36. Singh, G (2007): A bibliometric study of literature on digital library. The electronic library 25 (3); 342-348.

37. Tsay, M (2000): A bibliometric Study of semiconductor literature. Scietometircs 49 (3); 491-509.

38. Tove, F (2005): A bibliometirc analysis of economics Journal. Journal of documentation 61 (3); 385-401.

39. Tiew, W (2002): Malaysian Journals of library and information science: A bibliometirc study. Malaysiam Journal of library and information Sciene 6 (2); 43-56.

40. Tunger, D (2005): bibliometric analysis as part of a trend recognition system in science. Journals of information science and Technology 3 (2); 1-17.

41. Thelwaal, mike (2007); Bibliometirc to webometrics. Journals of information science 34 (4); 1-18.

42. White, E (1985): Bibliometrics from curiosity to convention special library. Winter; 35-42.

43. Ying Ding (2001): Bibliometric cartography of information vetrival research by using co-word analysis. Information processing and management 37 (6); 817-842.