CITATION TRENDS IN LIBRARY AND INFORMATION SCIENCE: A BIBLIOMETRIC STUDY OF LIBRARY HI TECH FROM 2009 TO 2014

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Abstract : The purpose of this study is to explore the citation trends and disclose the patterns of scholarly communication of the source journal Library Hi Tech from 2009 to 2014 through various facets of bibliometric. A total number of 288 articles comprising 7344 citations published in Library Hi Tech during the period under study were downloaded from Emerald Insights through UGC-INFONET Digital Library Consortium and analysis in detail in every possible aspect of bibliometric by using Microsoft Word and spreadsheet 2013. The study explores that majority of the articles published in LHT by a single author and the highest number of articles published in 2011 and also the highest number of citations were found in volume 32 in 2014. The majority of articles were research papers followed by case studies and the highest number of citations are from journals (53.59 percent) followed by web documents (20.98 percent) and books (13.81 percent). The analysis shows that the half-life of the citations of the journal, book and web document is 7, 10 and 6 years respectively and out of 18 core journals found in this study the Library hi-Tech itself got the highest rank with 7.24 percent of the total citations. As per the paucity of time and depth research implication, this research is limited to the source journal Library Hi Tech during the period of six years (2009 to 2014) and in total 288 papers published in 24 issues during the stated period were covered in this study.

Keywords: Library hi tech, Bibliometric study, Citation analysis, Bradford's law, Citation trends, Half-life of citations.

1.0 Introduction

The present study is a bibliometric analysis of international peer-reviewed journal *"Library Hi Tech" (LHT)* published quarterly by emerald publishing group with four issues per year or per volume. Starting from the year 1983, Library Hi Tech published original research articles devoted to the most promising areas of library and information science in a dynamic way such as integrated library system and networking, automation systems, architecture and technology, electronic publishing, library technology and related areas. LHT had published 32 successful volumes until the year 2014 with an average of 11-12 research articles per issue. In this study, articles published from volume 27 (2009) to volume 32 (2014) has been taken for analysis with respect to the following objectives:

- To find out the age and half-life period of the total citations for the period under study.
- To find out the authorship pattern of published articles and distribution of articles & citations per volume/year.
- To find out the bibliographical form of cited documents for the period under study.
- To extract the length of the article in respect to pages and classification of articles.
- To observe the chronological distribution of citations of journals, books and web-documents and extract the half-life period of these citations.
- To identify the core journals in library and information science by preparing the ranking list of journals cited in *LHT*.
- To examine the citations trends of the ranked journal and study the geographical distribution of contributors to *LHT* for the period under study.

2.0 Literature Review

There are a number of studies available on bibliometric and citation analysis, a few of among has been taken for reviewing to the context of the present study. (Singh, 2013) in his study "citation analysis of Collection building during 2005-2012" analysed that out of total 179 article during the said period, research papers and case studies

constituted 64.25 percent and single authorship has a dominant place with 118 (65.92 percent) articles. He further stated that the USA was the dominant country in the respect of contribution to the journal with 177 (69.96 percent) contributors and collection building itself proved as a source journal with highest 92 (9.02 percent) citations. (Jena et al., 2012) found in their study entitled "scholarly communication of The Electronic Library from 2003-2009: a bibliometric study" that total 417 article during the said period produced 7441 citations and out of those citations journals were predominant with 3649 (49.03 percent) citations. The study further revealed that single authorship (47.242 percent) was above all and majority of the article were research papers (46.283 percent) and China has the highest number of contributors (21.172 percent). The results also stated that 57.632 percent of journal citations and 38.435 percent of book citations were just 5 years old. (Singh and Chander, 2014) conducted a bibliometric study of 336 articles of Library management journal which produced 6611 citations in total for the period 2006-2012 and found that 40.18 percent were research papers out of the total articles and majority of citations were from journals followed by web document and books. The majority of the contributors (17.56 percent) to the journal articles were from the USA and affiliated with universities (79.46 percent) whereas single authorship has its dominant place with 190 (56.55 percent) articles. (Haridasan and Kulshrestha, 2007) examined the 115 articles through citation analysis published in Knowledge Organization during the period 1993-2001 and found that books were major information source with 51.75 percent citation and 76.2 percent of the total citation were single authored. (Hajam, 2014) carried out a bibliometric study of 776 articles published in Indian Journal of Clinical Biochemistry for ten years from 2004 to 2013 to observe the authorship pattern, distribution of citations, geographical distribution of contributors and length of papers. (Thavamani, 2013) examine the 151 library and information science journals available in Directory of Open Access Journals (DOAJ) as a bibliometric study. (Rao et al., 2014) conduct a bibliometric analysis of 4047 article published in Journal of Propulsion and Power (JPP) from 1985 to 2013. (Tsay, 2011) conduct a bibliometric study of Journal if Information Science (JIS) from 1998 to 2008 and found that journals articles were the most cited documents in in JIS and divided the cited journal into three main classes namely library science, social sciences and science. He further also divides the cited books into subclasses and found that the most cited subject of books was knowledge management. (Swain and Panda, 2012) has been made the same attempt for Journal of Intellectual Property Right from 2002 to 2010 by studied the 332 article with 1541 citations and found that in total 471 authors were contributed during the period of nine years.

3.0 Methodology

First of all the data in form of articles published in *Library Hi Tech (LHT)* from volume 29 (2009) to volume 34 (2014) were downloaded from Emerald Insights through UGC-INFONET Digital Library Consortium (an ambitious programme of University Grants Commission UGC to interlink all the Universities in the country with state-of-art technology), access provided by the Jawaharlal Nehru Central Library of Kurukshetra University. A total number of 288 articles containing 7344 citations have been analysed in this study in two parts, one is articles study including the authorship pattern, classification of articles, geographical distribution of contributors, length of articles etc. and second is the citation study which includes chronological distribution of citations volume wise and separately for the journals, books and web documents, document forms of the citations, extracting the rank list of core journals and their citation trends and the study also employs the Bradford's Law of Scattering. All the citations from each downloaded article were copied in the Microsoft$^{©}$ Word$^{©}$ 2013 in a table and assigned a serial number to each citation from 1 to 7344, however, the table was split for each volume separately. The citations then manually examine one by one for the bibliographic forms and a specific colour was assigned to the specific form of document to citations text in the tables such as "Red", "Purple", "Orange", "Light Blue", "Green", "Yellow" and "Black" for journals, books, web documents, conference proceedings, reports, thesis/dissertations and other unrecognized documents respectively. This complete table was further divided into separate tables for each form of citations and used in many ways with sorting function of the Microsoft$^{©}$ Word$^{©}$ for extracting the year wise distribution of citations and a ranking list of journals and then the extracted data was imported to Microsoft$^{©}$ Excel$^{©}$ 2013 for making final tables and graphs. Finally, all the entries were carefully examined, checked and arranged in a most sophisticated way for the reader's point of view.

4.0 Analysis and Discussion

4.1 Chronological Distribution of Citations:
Table I describes the year and volume wise chronological distribution of articles and citations, which clearly reveals that the number of published articles were highest in volume 29 in 2011 subsequently followed by the volume 27 and volume 30 in which the number of articles was same i.e. 48 in both volumes. The least number of articles (46 each) are found in 2013 and 2014 in volume 31 and 32 respectively. The highest number of citations 1651 (22.48 percent) were found in volume 32 in 2014 which yielded the least number of articles and the highest number of citations per articles (35.89) were also found in the

same volume, whereas the least number of citations 804 (11.76 percent) were found in volume 27 in 2009. The average number of citations per article was 25.50 and an average number of articles per issue was 12.

Table- I: Chronological Distribution of Articles and Citation (Volume And Year Wise)

Volume No. (Year)	No. of articles	Total No. of citation	Percentage of citations per issue	No. of citations per article	Average No. of articles per issue
27 (2009)	48	864	11.76	18.00	12
28 (2010)	47	1134	15.44	24.13	11.75
29 (2011)	53	1226	16.69	23.13	13.25
30 (2012)	48	1148	15.63	23.92	12
31 (2013)	46	1321	17.99	28.72	11.5
32 (2014)	46	1651	22.48	35.89	11.5
Total	288	7344	100	25.50	12

4.2 Authorship Pattern of Articles: Figure II depicts the authorship pattern that 40 percent of the total contributions made by single authors followed by the joint authors (37 percent) and three authors (17 percent). The contribution of more than three authors (6 percent) is quite minimum. The further analysis of authorship pattern in Table II shows that single authors are more dominant in respect of contribution rather than the joint authorship except for the volume 32 and 28 in the year 2014 and 2010 respectively which is led by the double authorship.
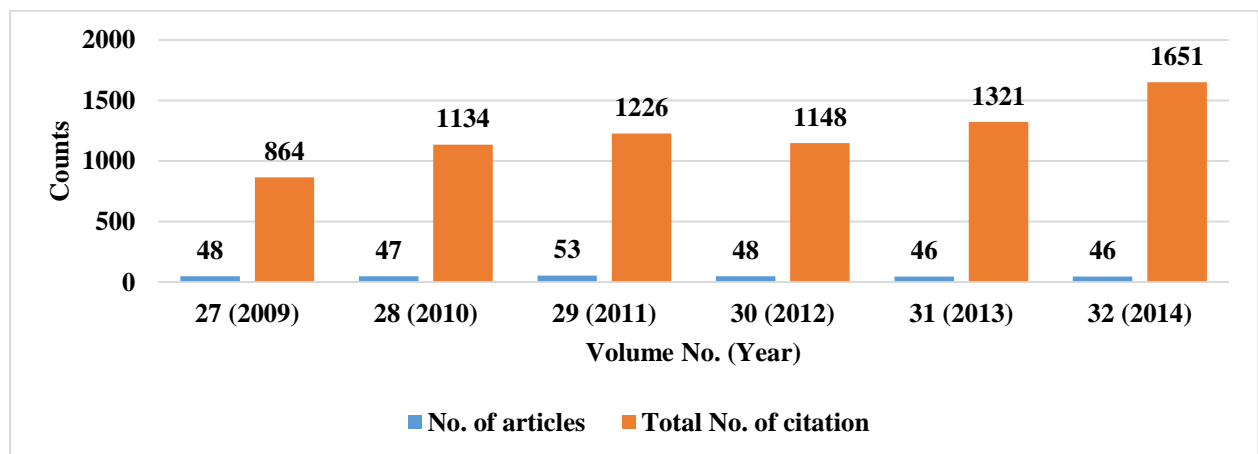

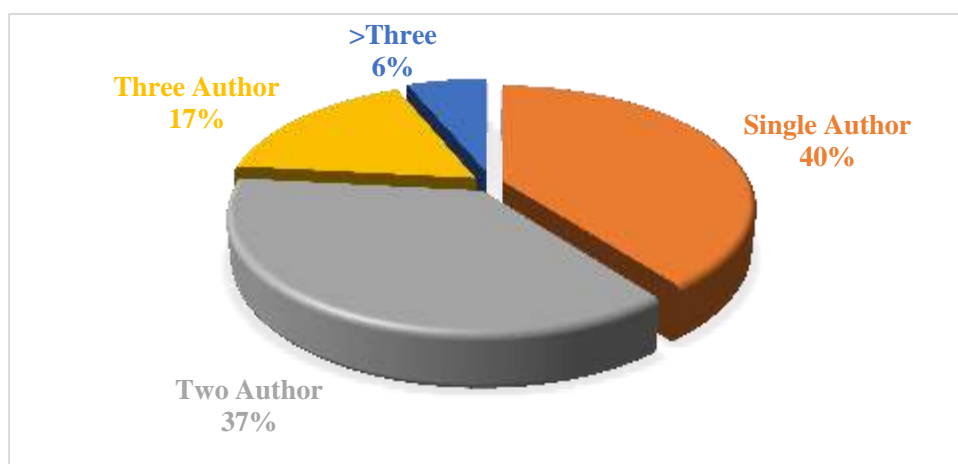**Figure I. Chronological distribution of articles and Citation (volume and year wise)**

Figure II. Authorship pattern of articles

4.3 Length of Articles: Table III addresses the length of articles on the account of pages. As per the count data are shown in the table, 37.15 percent articles were between the length of 11 to 15 pages followed by 16 to 20 pages (20.45 percent) and 6 to 10 pages (20.49 percent). However, both the lengthy and short articles are quite minimum as only 11.11 percent articles were more than 20 pages and 3.82 percent were of 1 to 5 pages in length. In the chronological point of view, the number of articles between 16 to 20 pages is more than the articles between 11 to 15 pages during 2013 and 2014 and continuously increasing from 2009 to 2014 except the year 2012 in volume 30.

Table II. Authorship Pattern of Articles

Authorship Pattern	Volume No (Year)						Total	Cumulative Total	Percentage	Cumulative percentage
	27th (2009)	28th (2010)	29th (2011)	30th (2012)	31st (2013)	32nd (2014)				
Single Author	22	18	24	26	14	10	114	114	39.58	39.93
Two Author	10	23	21	16	18	19	107	221	37.15	76.74
Three Author	13	6	7	5	8	10	49	270	17.01	93.75
More than Three	3	0	1	1	6	7	18	288	6.25	100.00
Total	48	47	53	48	46	46	288		100.00	

Table III. Length of Articles

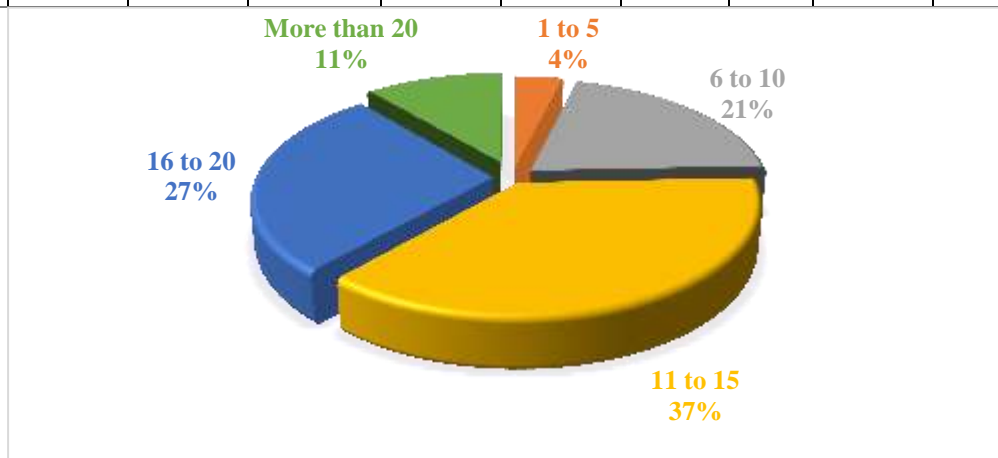| Length of Pages	Volume No. (Year)						Total	Cumulative Total	%age	Cumulative percentage
	27th (2009)	28th (2010)	29th (2011)	30th (2012)	31st (2013)	32nd (2014)				
1 to 5	3	1	3	2	2	0	11	11	3.82	3.82
6 to 10	15	8	12	14	5	5	59	70	20.49	24.31
11 to 15	20	21	20	14	15	17	107	177	37.15	61.46
16 to 20	9	11	12	11	17	19	79	256	27.43	88.89
More than 20	1	6	6	7	7	5	32	288	11.11	100.00
Total	48	47	53	48	46	46	288		100	

Figure III. Length of articles

4.4 Classification of Articles: Articles published in the *LHT* are categorised under the seven types i.e. Case study, conceptual paper, general review, literature review, research paper, technical paper and viewpoint. As shown in the Table IV, out of these seven category more than half of the articles (55.90 percent) were research papers which evident that contributors to the *LHT* were more intended towards qualitative research as they were more contribute to research paper rather than that other category such as case study (17.71 percent), conceptual paper (6.95 percent), general review (6.60 percent), technical paper and viewpoint (5.90 percent each) and literature review (1.04 percent) see Figure IV.

Table-IV: Classification of Articles (Volume and Year Wise)

Type of Articles	Volume No. (Year)						Total	Cumulative	Percentage	Cumulative Percentage
	27th (2009)	28th (2010)	29th (2011)	30th (2012)	31st (2013)	32nd (2014)				
Case study	10	11	8	6	9	7	51	51	17.71	17.71
Conceptual paper	6	5	1	7	1	0	20	71	6.94	24.65
General review	4	3	6	4	2	0	19	90	6.60	31.25
Literature review	0	1	1	1	0	0	3	93	1.04	32.29
Research paper	19	22	32	23	26	39	161	254	55.90	88.20
Technical paper	5	3	3	2	4	0	17	271	5.90	94.10
Viewpoint	4	2	2	5	4	0	17	288	5.90	100.00
Total	48	47	53	48	46	46	288		100	
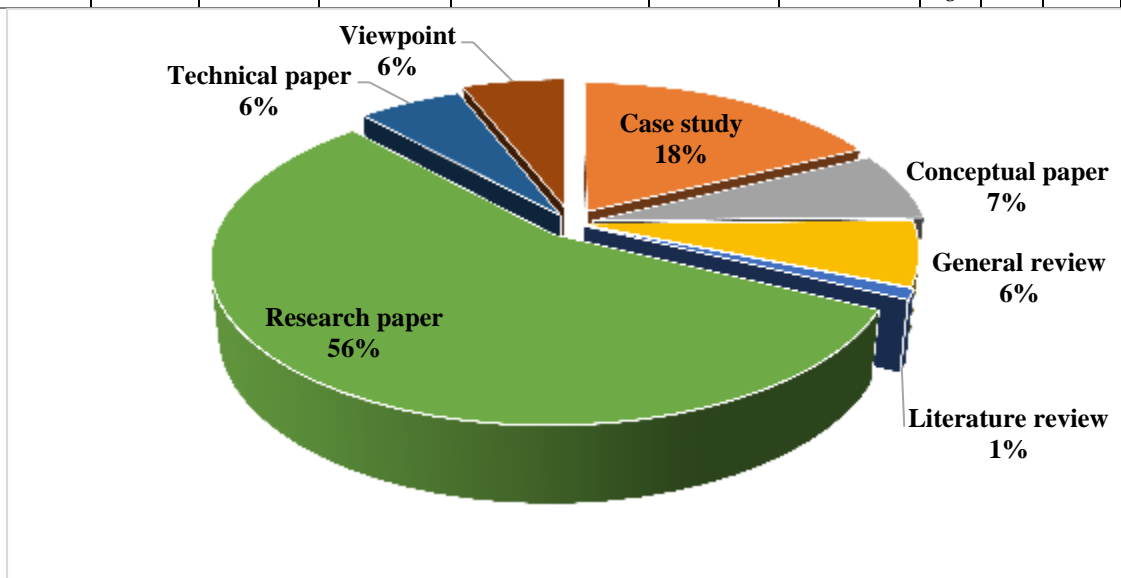
Figure IV. Classification of Articles

4.5 Geographical Distribution of Contributors And Most Productive Authors: Library hi tech has an international scope and welcomes the original research papers all around the world without any bias. In this context Table, V and VI show the geographical distribution of the contributors and most productive authors respectively. It is clearly shows that the United States of America get top rank with the highest number of contributors i.e. 188 (39.8 percent) subsequently followed by China with 30 (6.4 percent), India with 24 (5.1 percent), Australia with 23 (4.9

percent) and Canada and the United Kingdom with 22 (4.7 percent each) contributor. It is observed from the table that only three countries namely the USA, China and India were accounted for 51.2 percent of the total contributors to *LHT* and remaining 36 countries were accounted for the rest of the 48.8 percent contributors. While Table VI shows that Prof. Michael Seadle forms Germany and Prof. Ina Fourie from South Africa were the most productive authors of *LHT* for the period under study as both of them contribute in 20 and 14 articles respectively. The other productive others are including Prof. Elke Greifeneder from Germany, Younghee Noh from South Korea and Elaine Menard from Canada with 4 (1.39 percent) articles each. Furthermore, there were a number of contributors with 3 and 2 articles each, see Table VI.

Table V. Geographical Distribution of Contributors

Country	No. of Contributors	Cum no. of contributors	Percentage	Cumulative percentage
USA	188	188	39.8	39.8
China	30	218	6.4	46.2
India	24	242	5.1	51.2
Australia	23	265	4.9	56.1
Canada	22	287	4.7	60.8
UK	22	309	4.7	65.4
Germany	20	329	4.2	69.7
Spain	18	347	3.8	73.5
Taiwan	18	365	3.8	77.3
South Korea	14	379	3.0	80.3
Iran	10	389	2.1	82.4
Malaysia	8	397	1.7	84.1
France	7	404	1.5	85.6
South Africa	7	411	1.5	87.0
Denmark	6	417	1.3	88.3
Sweden	6	423	1.3	89.6
Ireland	5	428	1.1	90.6
Nigeria	4	432	0.8	91.5
Israel	4	436	0.8	92.3
Belgium	4	440	0.8	93.2
Switzerland	3	443	0.6	93.8
Slovenia	3	446	0.6	94.5
Norway	3	449	0.6	95.1
Italy	3	452	0.6	95.7
Algeria	2	454	0.4	96.2
Zimbabwe	2	456	0.4	96.6
Swaziland	2	458	0.4	97.0
Greece	2	460	0.4	97.4
Botswana	2	462	0.4	97.9
Other Countries (one each)	10	472	2.1	100.0
Total	472		100.0	

Table -VI: Most Productive Authors

Name of the authors	Number of Articles	Percentage	Country
Michael Seadle	20	6.94	Germany
Ina Fourie	14	4.86	South Africa
Elke Greifeneder	4	1.39	Germany
Younghee Noh	4	1.39	South Korea
Elaine Ménard	4	1.39	Canada
Sharon Q. Yang	3	1.04	USA
Thomas Baker	3	1.04	USA
Namjoo Choi	3	1.04	USA
Xianjin Zha	3	1.04	China
Yalan Yan	3	1.04	China
Arthur Hendricks	2	0.69	USA
Fei Xu	2	0.69	USA
Joyce Chapman	2	0.69	USA
Kenning Arlitsch	2	0.69	USA
Rohani Tarmizi	2	0.69	Malaysia
Malathi Letchumanan	2	0.69	Malaysia
Melissa A. Hofmann	2	0.69	USA
Yong Kim	2	0.69	South Korea
Judith Wusteman	2	0.69	Ireland
David Stuart Holmes Rosenthal	2	0.69	USA
Priscilla Caplan	2	0.69	USA
Margaret Smithglass	2	0.69	Canada
Kenning Arlitsch	2	0.69	USA
Lori S. Mestre	2	0.69	USA
Mildred Coates	2	0.69	USA
Yan Quan Liu	2	0.69	USA
Fereshteh Didegah	2	0.69	Iran
Huang Xianrong	2	0.69	China
Liyi Zhang	2	0.69	China
Herman Fourie	2	0.69	South Africa
Barbara Sen	2	0.69	UK
Mohamed Ridda Laouar	2	0.69	Algeria
Richard Hacken	2	0.69	USA
Jinchao Zhang	2	0.69	China
Amed Leiva-Mederos	2	0.69	Spain
José A. Senso	2	0.69	Spain
Sandor Domínguez-Velasco	2	0.69	Spain
Pedro Hípola	2	0.69	Spain
Mathew Miles	2	0.69	USA
Others (one article each)	353		Other countries

4.6 Bibliographical Form of Cited Documents: Citations are varied in the bibliographic nature such as journals, books, reports, thesis etc. as the authors cite all these types of documents according to their need in *LHT*. In the present study, the bibliographical form of the citation was categorised under the journals, web documents, books, conference proceedings, report, thesis/dissertation and other documents as shown in Table VII. It is observed that authors of *LHT* were preferred the journal articles which were most cited documents with 3936 (53.59 percent) citations and as natural, journal articles were always dominant material to cite in the research work. The study further reveals that journal citations were followed by web document citations 1541 (20.98 percent), books 1014 (13.81 percent), conference proceedings 573 (7.8 percent), report (1.48 percent), thesis/dissertation (0.85 percent) and other documents such as standards, pamphlet etc. are 1.50 percent, see Figure V.

Table-VII: Bibliographical Form Of Cited Documents

Document Form	Volume No. (Year)						Total no. of citations	Cumulative total	%age	Cumulative %age
	27th (2009)	28th (2010)	29th (2011)	30th (2012)	31st (2013)	32nd (2014)				
Journals	409	534	652	623	692	1026	3936	3936	53.59	53.59
Books	114	143	184	140	219	214	1014	4950	13.81	67.40
Web Documents	199	339	250	248	234	271	1541	6491	20.98	88.38
Conf. Proceedings	102	61	82	88	122	118	573	7064	7.80	96.18
Reports	24	16	16	29	21	3	109	7173	1.48	97.67
Thesis/ Dissertation	5	11	12	8	14	11	61	7234	0.83	98.50
Other Documents	11	30	30	12	19	8	110	7344	1.50	100.00
Total	**864**	**1134**	**1226**	**1148**	**1321**	**1651**	**7344**		100	

4.7 Age and Half-Life of Citations : Table VIII shows the age of total cited documents that the contributors tend to cite the most recent documents in their papers. It is observed from the table that 23.24 percent citations were just 1 to 5 year old and near about 66 percent citations in total were just 10 years old. Figure VI depicts the age and half-life of the total citations of *LHT* for the period under study which clearly reveals that 50 percent of the total citations are yielded in 6 years which is considered as the half-life of citations. This half-life is shown by a line drawn horizontally from point A and meet the age curve at point O and then a perpendicular is drawn from point O to the horizontal line which shows the years at point B. Here the point A represents the half of the total cumulative citations which is 3672 and the point B is represents the half-life period of total citations which is 6 years.
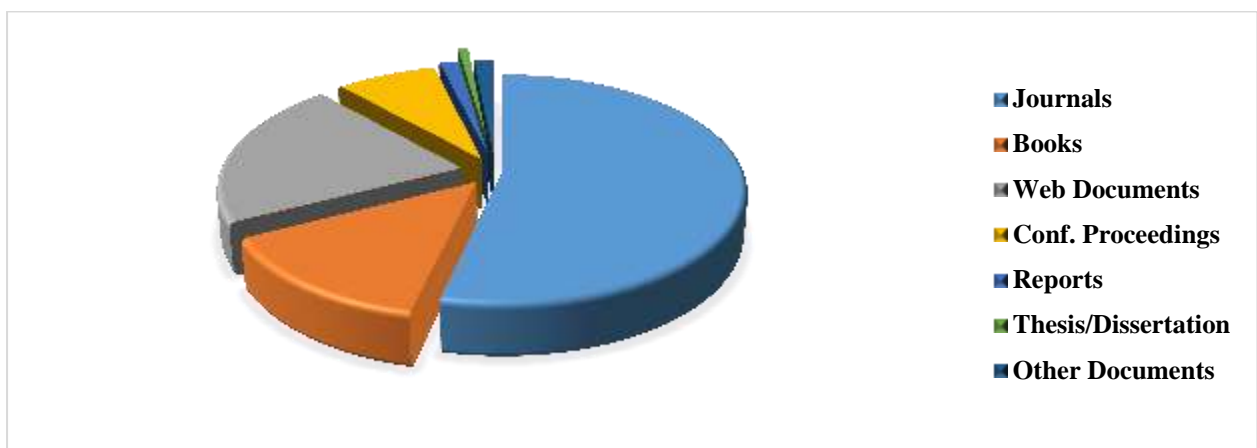

Figure V. Bibliographical form of cited documents

Table- VIII: Age of Citation

| Age	No. of citations	Cumulative Citation	Percentage	Cumulative Percentage
1 to 5	1707	1707	23.24346	23.24346
6 to 10	3135	4842	42.68791	65.93137
11 to 15	1297	6139	17.66068	83.59205
16 to 20	492	6631	6.699346	90.29139
21 to 25	218	6849	2.96841	93.2598
26 to 30	131	6980	1.783769	95.04357
31 to 35	72	7052	0.980392	96.02397
36 to 40	42	7094	0.571895	96.59586
41 to 45	39	7133	0.531046	97.12691
46 to 50	35	7168	0.47658	97.60349
Above 50	52	7220	0.708061	98.31155
Not Dated	124	7344	1.688453	100
	7344		100	
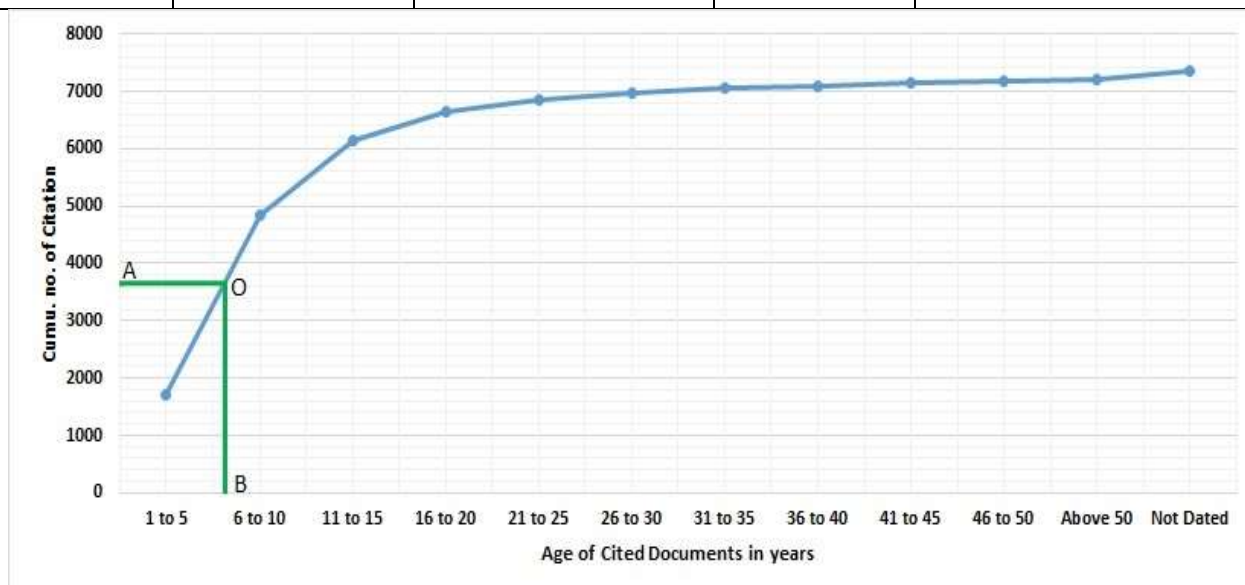
Figure VI. Age of citations (Half-life)

4.8 Chronological Distribution Of Citations: Table IX, X and XI addressed to the chronological distribution of journals, books and web documents respectively. From the journal distribution, it was found that contributors were referred most recent documents that may be published in the same year. Contributors were cited 20.3 percent of the journal articles of one year old followed by 4.65 percent, 7.60 percent, 8.61 percent, 8.41 percent and 10.32 percent were two, three, four, five and six year old respectively. Within the first 7 years, the total citations of the journal articles cross the half line and constitute 51.75 percent which clearly indicates that the half-life of the journal citations is 7 year (See Figure VII). However, after the 6th year, the citations were continuously decreased at a rate of more than one percent per year till 15th year.

Table IX: Chronological Distribution Of Citations (Journal)

Year	Age in years	No. of citations	Cumulative citations	Percentage	Cumulative percentage
2014	0	6	6	0.15	0.15
2013	1	80	86	2.03	2.18
2012	2	183	269	4.65	6.83

2011	3	299	568	7.60	14.43
2010	4	339	907	8.61	23.04
2009	5	331	1238	8.41	31.45
2008	6	406	1644	10.32	41.77
2007	7	393	2037	9.98	51.75
2006	8	351	2388	8.92	60.67
2005	9	265	2653	6.73	67.40
2004	10	197	2850	5.01	72.41
2003	11	180	3030	4.57	76.98
2002	12	141	3171	3.58	80.56
2001	13	117	3288	2.97	83.54
2000	14	100	3388	2.54	86.08
1999	15	58	3446	1.47	87.55
1998	16	52	3498	1.32	88.87
1997	17	63	3561	1.60	90.47
1996	18	47	3608	1.19	91.67
1995	19	32	3640	0.81	92.48
1994	20	30	3670	0.76	93.24
1993	21	27	3697	0.69	93.93
1992	22	21	3718	0.53	94.46
1991	23	21	3739	0.53	94.99
1990	24	17	3756	0.43	95.43
1989	25	23	3779	0.58	96.01
Before 1989	>25 <88	157	3936	3.99	100.00

Table X shows that contributors were also citing the currently published books, however, the intensity of such citations is comparatively less than the journal and web document citations. It is cleared that more than half of the book citations (51.68 percent) were just 10 years old which indicates towards the half-life of book citations (see Figure VIII) and total citations within 15 years is 69.63 percent. While the citation trends are decreasing steadily with some ups and downs after the 7th year of publication.
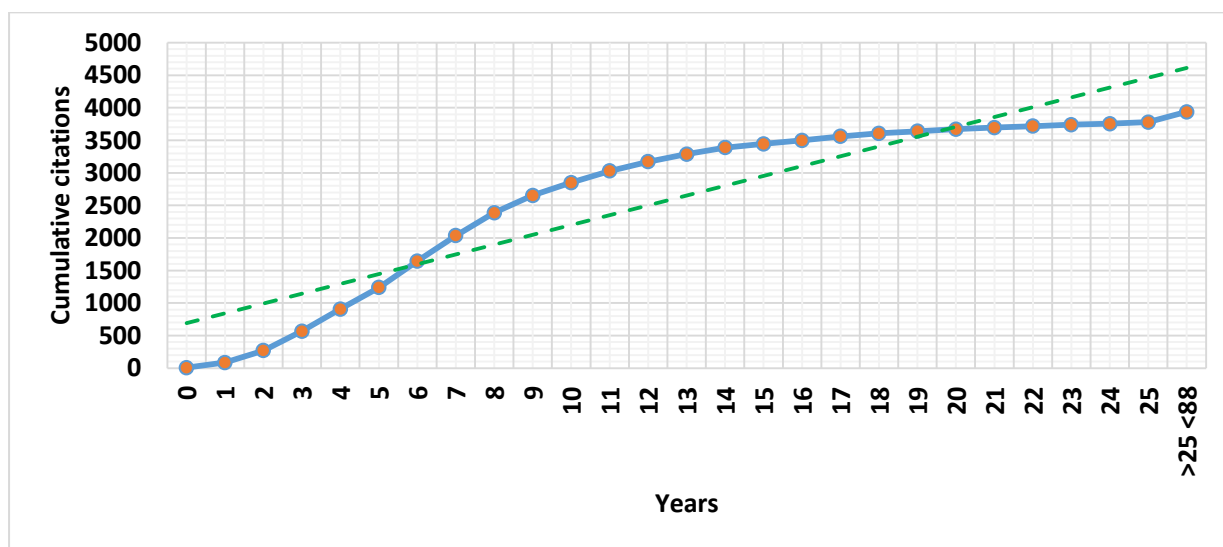

Figure VII. Chronological distribution of citations (Journal)

Table X. Chronological distribution of citations (Books)

Year	Age in years	No. of Citations	Cumulative citations	Percentage	Cumulative Percentage
2014	0	1	1	0.10	0.10
2013	1	13	14	1.28	1.38
2012	2	25	39	2.47	3.85
2011	3	45	84	4.44	8.28
2010	4	60	144	5.92	14.20
2009	5	57	201	5.62	19.82
2008	6	59	260	5.82	25.64
2007	7	102	362	10.06	35.70
2006	8	55	417	5.42	41.12
2005	9	64	481	6.31	47.44
2004	10	43	524	4.24	51.68
2003	11	64	588	6.31	57.99
2002	12	34	622	3.35	61.34
2001	13	24	646	2.37	63.71
2000	14	27	673	2.66	66.37
1999	15	33	706	3.25	69.63
1998	16	30	736	2.96	72.58
1997	17	19	755	1.87	74.46
1996	18	21	776	2.07	76.53
1995	19	20	796	1.97	78.50
1994	20	16	812	1.58	80.08
1993	21	9	821	0.89	80.97
1992	22	9	830	0.89	81.85
1991	23	16	846	1.58	83.43
1990	24	17	863	1.68	85.11
1989	25	11	874	1.08	86.19
Before 1989	>25 <127	140	1014	13.81	100.00
Total		1014		100.00	

Figure VIII. Chronological distribution of citations (Books)
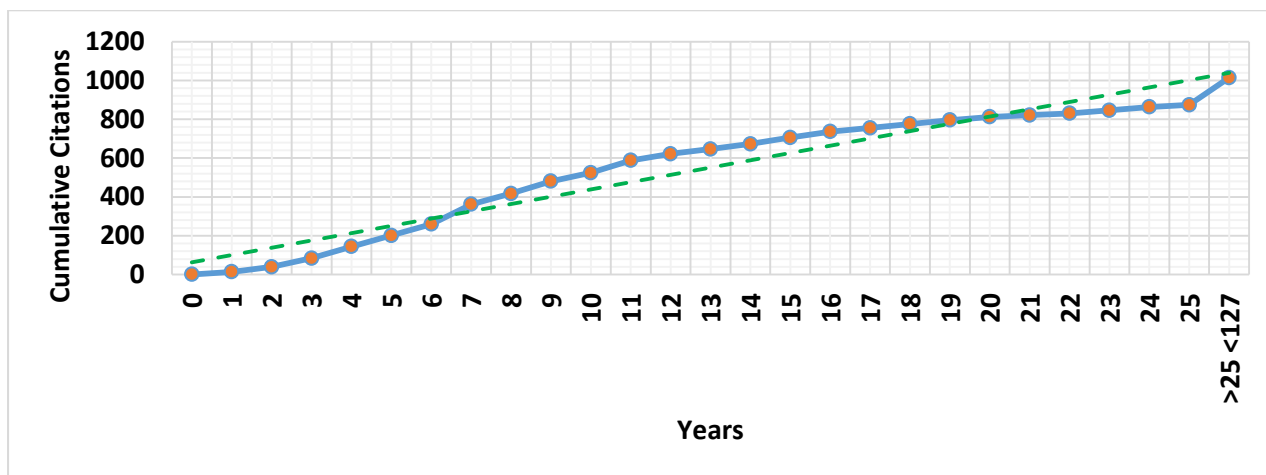
Web documents are frequently up to date in all aspects such as information, scope, nature, reliability, etc. so the contributors were keen to citing the web documents. Table XI reveals that the citations of web documents were more current in use than journals and books as 6.10 percent of the citations were just one year old and within 6 years, which also the half-life of web citations, the total web document citations were constituted its 57.82 percent. 80 percent of the total web document citations were yielded within 10 years. Although, after 6th-year percentage share of citations is steady decreases.
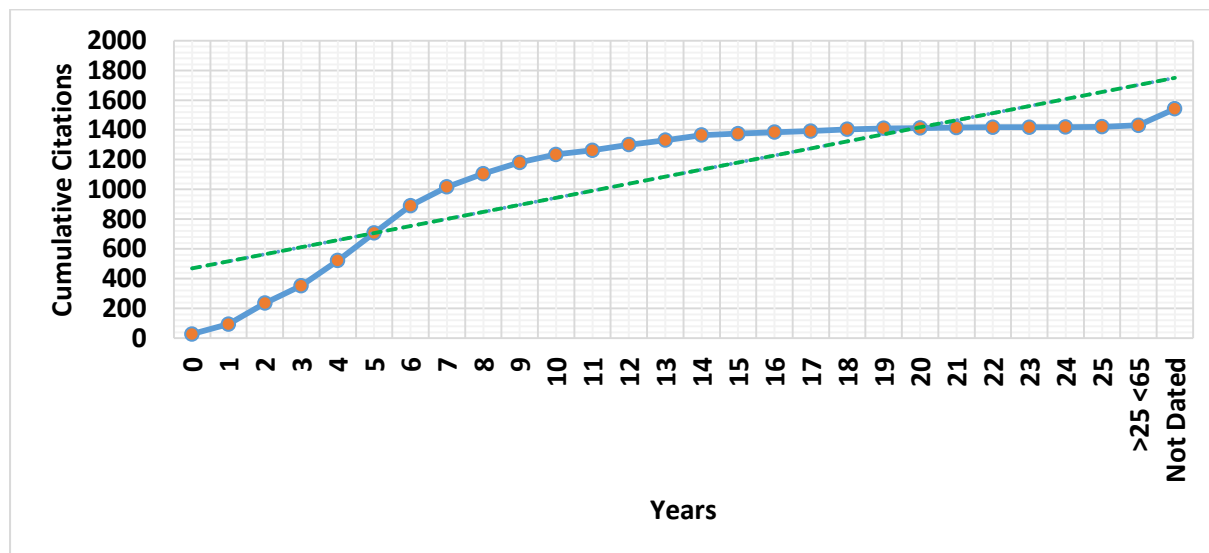
Figure IX. Chronological distribution of citations (Web Documents)

Table- XI: Chronological Distribution of Citations (Web Documents)

Year	Age in years	No. of citations	Cumulative citations	Percentage	Cumulative percentage
2014	0	28	28	1.82	1.82
2013	1	66	94	4.28	6.10
2012	2	141	235	9.15	15.25
2011	3	118	353	7.66	22.91
2010	4	169	522	10.97	33.87
2009	5	184	706	11.94	45.81
2008	6	185	891	12.01	57.82
2007	7	125	1016	8.11	65.93
2006	8	90	1106	5.84	71.77
2005	9	75	1181	4.87	76.64
2004	10	54	1235	3.50	80.14
2003	11	28	1263	1.82	81.96
2002	12	37	1300	2.40	84.36
2001	13	31	1331	2.01	86.37
2000	14	34	1365	2.21	88.58
1999	15	10	1375	0.65	89.23
1998	16	9	1384	0.58	89.81
1997	17	8	1392	0.52	90.33
1996	18	12	1404	0.78	91.11
1995	19	6	1410	0.39	91.50

1994	20	2	1412	0.13	91.63
1993	21	4	1416	0.26	91.89
1992	22	2	1418	0.13	92.02
1991	23	0	1418	0.00	92.02
1990	24	1	1419	0.06	92.08
1989	25	2	1421	0.13	92.21
Before 1989	>25 <65	10	1431	0.65	92.86
Not Dated	Not Dated	110	1541	7.14	100.00
		1541			

4.9 Ranking of cited journals: Journal is always at the dominant status in respect of research and scientific communication and scholarly output. Librarians, document officers, information manager of research and information centres, researcher, libraries and other academic institutions keen to formulate the best acquisition policy for acquiring journals which can meet all type of information, academic and research needs of their clientele such as library and information science scholars, teachers and students. In this regard Table, XII provides the list of journals according to the rank which was cited in *LHT* in their decreasing number of citations. This list is free from any bias such as geographical, cultural etc. as it has been prepared on the basis of citations given in *LTH* articles. The reputed journal in the field of library and information science get a high rank with an utmost number of citation, as the number of citation is decreased the ranking of the journal goes down.

Table- XII: Ranking List of Cited Journals

Sr. No.	Ranking	Name of Journal	No. of citations	Cumulative citations	Percentage	Cumulative Percentage
1	1	Library Hi Tech	285	285	7.24	7.24
2	2	Journal of the American Society for Information Science and Technology	119	404	3.02	10.26
3	3	D-Lib Magazine	102	506	2.59	12.86
4	4	The Electronic Library	75	581	1.91	14.76
5	5	The Journal of American Librarianship	72	653	1.83	16.59
6	6	Library Journal	69	722	1.75	18.34
7	7	Information Processing and Management	64	786	1.63	19.97
8	8	Library and Information Science Research	61	847	1.55	21.52
9	9	Library Trends	58	905	1.47	22.99
10	10	Journal of Documentation	55	960	1.40	24.39
11	11	Information Technologies and Libraries	52	1012	1.32	25.71
12	12	Computers in Libraries	51	1063	1.30	27.01
13	13	College & Undergraduate Libraries	50	1113	1.27	28.28
14	14	Online Information Review	49	1162	1.24	29.52
15	15	Program: Electronic Library & Information Systems	39	1201	0.99	30.51
16	16	Journal of Information Science	38	1239	0.97	31.48
17	17	Communications of the Association for Computing Machinery (ACM)	33	1272	0.84	32.32
18	18	Library Review	32	1304	0.81	33.13
19	19	Library Technology Reports	30	1334	0.76	33.89
20	20	MIS Quarterly	29	1363	0.74	34.63

21	21	Annual Review of Information Science and Technology (ARIST)	28	1391	0.71	35.34
22	22	OCLC Systems and Services: International Digital Library Perspectives	27	1418	0.69	36.03
23	= 22	Aslib Proceedings: New Information Perspectives	27	1445	0.69	36.71
24	23	Scientometrics	26	1471	0.66	37.37
25	24	Reference Services Review	25	1496	0.64	38.01
26	25	Serials Review	24	1520	0.61	38.62
27	= 25	New Library World	24	1544	0.61	39.23
28	26	Ariadne	23	1567	0.58	39.81
29	27	Online	22	1589	0.56	40.37
30	= 27	Libri: International Journal of Libraries and Information Services	22	1611	0.56	40.93
31	28	Internet Reference Services Quarterly	21	1632	0.53	41.46
32	= 28	Information and Management	21	1653	0.53	42.00
33	29	Expert Systems with Applications	20	1673	0.51	42.51
34	30	First Monday	19	1692	0.48	42.99
35	= 30	Computer and Education	19	1711	0.48	43.47
36	31	Medical Reference Services Quarterly	18	1729	0.46	43.93
37	= 31	Decision Support Systems	18	1747	0.46	44.39
38	= 31	Cataloguing & Classification Quarterly	18	1765	0.46	44.84
39	32	Information Systems Research	17	1782	0.43	45.27
40	= 32	Behavior and Information Technology	17	1799	0.43	45.71
41	33	Computers in Human Behavior	16	1815	0.41	46.11
42	34	Portal: Libraries & The Academy	15	1830	0.38	46.49
43	= 34	Journal of Digital Information	15	1845	0.38	46.88
44	= 34	Information Research	15	1860	0.38	47.26
45	= 34	College & Research Libraries News	15	1875	0.38	47.64
46	35	The Reference Librarian	14	1889	0.36	47.99
47	= 35	International Journal of Human Computer Studies	14	1903	0.36	48.35
48	= 35	Bulletin of the American Society for Information Science and Technology	14	1917	0.36	48.70
49	36	Searcher: The Magazine for Database Professionals	13	1930	0.33	49.03
50	= 36	Reference and User Services Quarterly	13	1943	0.33	49.36
51	= 36	International Journal of Human-Computer Interaction	13	1956	0.33	49.70
52	37	Science	12	1968	0.30	50.00
53	= 37	Journal of Web Librarianship	12	1980	0.30	50.30
54	= 37	Journal of the Medical Library Association	12	1992	0.30	50.61
55	= 37	Journal of Library Administration	12	2004	0.30	50.91
56	38	Webology	11	2015	0.28	51.19

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57	= 38	The Serials Librarian	11	2026	0.28	51.47
58	= 38	Management Science	11	2037	0.28	51.75
59	= 38	Journal of Librarianship and Information Science	11	2048	0.28	52.03
60	= 38	Journal of Access Services	11	2059	0.28	52.31
61	= 38	Interaction with Computers	11	2070	0.28	52.59
62	= 38	Archives and Manuscripts	11	2081	0.28	52.87
63	39	Universal Access in the Information Society	10	2091	0.25	53.13
64	= 39	Scientific American	10	2101	0.25	53.38
65	= 39	Reference Librarian	10	2111	0.25	53.63
66	= 39	Library Resources and Technical Services	10	2121	0.25	53.89
67	= 39	Library Philosophy and Practice	10	2131	0.25	54.14
68	= 39	International Journal of Information Management	10	2141	0.25	54.40
69	= 39	Information Today	10	2151	0.25	54.65
70	= 39	Information Services and Use	10	2161	0.25	54.90
71	= 39	Information Retrieval	10	2171	0.25	55.16
72	= 39	EDUCAUSE Review	10	2181	0.25	55.41
73	= 39	Code4Lib Journal	10	2191	0.25	55.67
74	= 39	Australian Academic & Research Libraries	10	2201	0.25	55.92
75	40	10 Journals (9 each)	90	2291	2.29	58.21
76	41	8 Journals (8 each)	64	2355	1.63	59.83
77	42	6 Journals (7 each)	42	2397	1.07	60.90
78	43	20 Journals (6 each)	120	2517	3.05	63.95
79	44	18 Journals (5 each)	90	2607	2.29	66.23
80	45	40 Journals (4 each)	160	2767	4.07	70.30
81	46	65 Journals (3 each)	195	2962	4.95	75.25
82	47	157 Journals (2 each)	314	3276	7.98	83.23
83	48	660 Journals (1 each)	660	3936	16.77	100.00

Out of the total 3936 citations, the journal *Library Hi Tech* itself get the highest rank with 285 (7.24 percent) citations and may be the reason behind it the wide subject coverage, scope and popularity among the scholars. The second most cited journal is *Journal of the American Society for Information Science and Technology* as it is cited 119 times followed by *D-Lib Magazine* get 3rd rank with 102 citations (2.59 percent), *The Electronic Library* with 75 citations get 4th rank, *Journal of American Librarianship* with 72 citations get 5th rank. It is observed that first 10 ranked journals make 960 (24.39 percent) of total citations and first 52 journals accounted for exact 50 percent (1968 citations) and reaming 1006 journals accounted for rest of the 50 percent citations.

4.10 Scattering of Citations and Citation Trends of Ranked Journals: As depicted in Table XIII, the data regarding scatter of citations of journal title shows that 51 (4.89 percent) journal out of the total 1058 journals accounted for 1956 (49.70 percent) of the total citations. Through the observation of the table, it can be concluded that the journal citations were not very much scattered in the case of core journals as a large number of citations taken from less than 5 percent journals but for remaining journals, it shows high scattering that is 1980 (50.30 percent) citations cover 1007 journal.

> TJ = 1058 (total number of journal)
> CC = 3936 (total number of citations received by 1058 journals)
> Average citation per journal: CC/TJ = 3.72

In the present study, the average number of citations is 3.72 per journal which shows the high scattering because the less number of citations per journal shows high scattering and vice versa. Scattering index (SI) is the proportion of journal titles that were cited only once to the total number of the journal (Jena et al., 2012) and here out the 1058 total journals, 660 are cited only for once. In this study, the SI is 0.623 (660/1058) which indicates high scatter as the scattering index value is more than 0.5.

Table-XIII: Scattering Of Citations and Citation Trends Of Ranked Journal

Rank	No. of Citation in each ranked Journal	No. of Journals in equal rank	Cumulative no. of journals in equal rank	Cumulative no. of in Journals equal rank (%)	Total no of citations in equal ranked journals	Cumulative no. of citations in equal ranked journals	Cumulative no. of citations in equal ranked journals (%)
1	285	1	1	0.095	285	285	7.24
2	119	1	2	0.189	119	404	10.26
3	102	1	3	0.284	102	506	12.86
4	75	1	4	0.378	75	581	14.76
5	72	1	5	0.473	72	653	16.59
6	69	1	6	0.567	69	722	18.34
7	64	1	7	0.662	64	786	19.97
8	61	1	8	0.756	61	847	21.52
9	58	1	9	0.851	58	905	22.99
10	55	1	10	0.945	55	960	24.39
11	52	1	11	1.040	52	1012	25.71
12	51	1	12	1.134	51	1063	27.01
13	50	1	13	1.229	50	1113	28.28
14	49	1	14	1.323	49	1162	29.52
15	39	1	15	1.418	39	1201	30.51
16	38	1	16	1.512	38	1239	31.48
17	33	1	17	1.607	33	1272	32.32
18	32	1	18	1.701	32	1304	33.13
19	30	1	19	1.796	30	1334	33.89
20	29	1	20	1.890	29	1363	34.63
21	28	1	21	1.985	28	1391	35.34
22	27	2	23	2.174	54	1445	36.71
23	26	1	24	2.268	26	1471	37.37
24	25	1	25	2.363	25	1496	38.01
25	24	2	27	2.552	48	1544	39.23
26	23	1	28	2.647	23	1567	39.81
27	22	2	30	2.836	44	1611	40.93
28	21	2	32	3.025	42	1653	42.00
29	20	1	33	3.119	20	1673	42.51
30	19	2	35	3.308	38	1711	43.47
31	18	3	38	3.592	54	1765	44.84
32	17	2	40	3.781	34	1799	45.71

33	16	1	41	3.875	16	1815	46.11
34	15	4	45	4.253	60	1875	47.64
35	14	3	48	4.537	42	1917	48.70
36	13	3	51	4.820	39	1956	49.70
37	12	4	55	5.198	48	2004	50.91
38	11	7	62	5.860	77	2081	52.87
39	10	12	74	6.994	120	2201	55.92
40	9	10	84	7.940	90	2291	58.21
41	8	8	92	8.696	64	2355	59.83
42	7	6	98	9.263	42	2397	60.90
43	6	20	118	11.153	120	2517	63.95
44	5	18	136	12.854	90	2607	66.23
45	4	40	176	16.635	160	2767	70.30
46	3	65	241	22.779	195	2962	75.25
47	2	157	398	37.618	314	3276	83.23
48	1	660	1058	100.000	660	3936	100.00

4.11 Application of Bradford's Law of Scattering: Applying the well-known Bradford's law of scattering to the present study, the complete sample of 3936 citations can be divided into three equal zones containing 1312 citations each. As shown in Table XII, the first quantum of 1312 citations covers under the first zone called "nuclear zone" contained 18 journals and all the journal falling in this zone are considered as "core journals". The second quantum of 1312 citations covers under the second zone or the first "peripheral zone" around the nuclear zone contained next 118 journals and these journals are known as "allied journals". The third and last quantum of 1312 citations forming the third zone or the second "peripheral zone" around the first peripheral zone contained the next 922 journals and these journals are known as "alien journals". The ratio of number of journals in all the zones is 18:118:922, which is almost equivalent to 18: 18 * 7: 18 * 7^2, where 18 represents the number of journals in the nucleus and n = 7 is a multiplier according to Bradford's pattern which is "m: m*n: m*n^2" where m is the number of core journals in a discipline and n is Bradford multiplier. In this context, the present study confirmed the Bradford law of scattering. (Jena et al., 2012) have also applied the Bradford's Law of scattering to their study, which reveals that the ratio of journals in above three zones was 18:118:898 and confirmed the law that is also similar to the present study.

5.0 Highlights of Major Findings:

The major findings of this study are summarised and highlighted below:

- The highest number of the article were published in volume 29 in 2011 while the highest number of citation were yielded in volume 32 in 2014 and lowest citations were found in volume 27 in 2009.
- Single authorship was found on top with 39.58 percent of articles followed by the joint authorship which was 37.15 percent.
- The majority of the articles were found research papers (55.90 percent) rather than other types of paper and also the highest number of articles (37.15 percent) were found between the 11 to 15 pages of length.
- The highest number of contributors to LHT were from USA (39.8 percent) followed by China (6.4 percent) and India (5.1 percent) which makes the more than 50 percent of the total contributors to the source journal.
- More than half of the citations which is 3936 (53.59 percent) were from journals followed by web documents (20.98 percent) and books (13.81 percent).
- The half-life of the total citations is 6 year which is equivalent to the half-life of the web document citations while in the case of journal and book citations, the half-life is 7 and 10 years respectively.
- As per the application of Bradford's Law of scattering and a ranking list of the journal according to the number of citations, in total 18 core journals are found with high productivity. These core journals are *Library Hi Tech* (source journal), *Journal of the American Society for Information Science and Technology*, *D-Lib Magazine*, *The Electronic Library*, *The Journal of American Librarianship*, *Library Journal*,

Information Processing and Management, *Library and Information Science Research*, *Library Trends*, *Journal of Documentation*, *Information Technologies and Libraries*, *Computers in Libraries*, *College & Undergraduate Libraries*, *Online Information Review*, *Program: Electronic Library & Information Systems*, *Journal of Information Science*, *Communications of the Association for Computing Machinery (ACM)* and *Library Review.*

6.0 Conclusion

The *Library Hi Tech*, one of the leading international journal in the field of library and information science continues promoting the research by publishing original research output of the intellect minds around the world. This study present the analysis of six-volume from 2009 to latest 2014 which shows that dominant status of sole authorship (39.93 percent) and research papers (55.90 percent), this may help research scholars in higher academic institutions, teachers, librarians to enhance their knowledge by reviewing and examined the finding of research output published in the *LHT*. The application of Bradford's Law of scattering is appropriately fitted to this study and among the 18 core journal with high productivity in the field of library and information science, the source journal *Library Hi-tech* get the first rank with the highest number of citations which shows the popularity of LHT among the researchers. So, this study may be helpful in formulating the acquisition policy of journals in academic libraries to subscribe *LHT* for their users as *LHT* and its editorial board accepting the original research papers across the world and also promote and motivate the young researchers in the field of library and information science.

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