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A scientometric profile of research productivity on library herald: A single journal study

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Abstract
This paper aims to know the impact of research trends on the Library Herald for nine years form 2006 to 2014. This paper has analyzed various factors such as authorship pattern, productivity, and collaboration among multi- authors, year-wise distribution of papers, institution and subject wise distribution and many more features. The result shows that the highest number i.e. 137 (54.37%) contributors have published a single author whereas the rest of lowest number i.e. 115 (45.63%) of papers were published by co-authors. The maximum number of 89.68% documents was published from Indian authors and the minimum numbers of 10.32% papers were published by foreign authors. The maximum numbers of (407) citations were in 2007 and the average citation per article was 12.33. The least number of citations was 156 and the average citations per article were 8.67.

Keywords: Scientometrics, research trends, authorship pattern, library herald, research productivity, collaboration

1. Introduction
The terms Bibliometrics and Scientometrics were equally focussed by Pritchard, Nalimov and Mulchenko in 1969, Glanzel (2003) [1]. Pritchard (1969) [2] explained the term Bibliometrics as "the application of mathematical and statistical methods to books and other media of communication" while Nalimov and Mulchenko defined scientometrics as "the application of quantitative methods which deal with the analysis of science viewed as an information process**".** According to these views, Scientometrics is restricted to the measurement of science communication, whereas Bibliometrics is designed to deal with more information processes.
Library Herald [3] is a peer reviewed scholarly journal which has been published by Delhi Library Association (DLA) and this association has recently contributed 52 volumes successfully up to 2014. The frequency of publication is quarterly (March, June, September and December) print as well as online formats are also available. This journal publishes original research articles in the filed of Library and Information Science and it also covers users' studies, bibliometric analysis, Library Automation, Digital Libraries, Professional challenges, Internet, Web Technology and Information Literacy. The electronic version of this journal articles are available in their official website i.e. http://www.indianjournals.com from 2000 onwards. This journal has been indexed and abstracted by Indian Citation Index since 2000.

2. Related Work
Dhiman (2000) [4] identified the bibliometric study pattern in the Ethnobotany Journal and discussed about the authorship pattern and productivity, citation analysis during the period of study. Tiew *et al* (2002) [5] investigated bibliometric study on Malaysian journal of Library and Information Science during 1996 – 2000. This study analyzed various parameters and the results indentified that the majority of authors were affiliated to Malaysia based institutions and highest number of articles were published research oriented and the multi-authored papers were higher than the single authored ones.
Aoki (2002) [6] examined on practice guidelines from MEDLINE and analyzed and retrieved 4,487 scientific papers. The study found that 108 papers were published in 1991 and 436 in1992 for 4-fold increase.

The majority of common topics were HIV infection, Breast Neoplasms, Mass screening, Asthma as well as Hypertension. Newby; Greenberg and Jones (2003) [7] observed from the open software development and identified how to apply Lotka's law in programming. Ian Rowlands (2005) [8] has analyzed on emerald data using Lotka law and research productivity in terms of high, medium and low level of authors. The results show that the findings would be helpful for future research on authors' loyalty.

Verma *et al* (2007) [9] observed on Annals of Library and Information Studies for the period between 1999 and 2005 in which authorship pattern, citation analysis, chronology wise distribution and the findings revealed that most of the contributions were by solo author. Yeoh and Kaur (2008) [10] have studied the research output in Higher Education for subject support in collection management in terms of growing interest in research using the bibliometric tools. The results showed that a positive trend in research collaboration of contributing authors, and a steady growth in the use of reference sources, periodicals and web documents found towards scholarly communications.

Tanuskodi (2011) [11] has analyzed a study on Library Herald during the period between 2006 and 2010. The findings of the results in terms of authorship pattern and productivity revealed that out of 138 research papers, 52.17 % of articles were contributed by solo author and the rest of 47.83 % of articles were contributed by multi-authored. Velmurugan (2013) [12] investigated the bibliometric analysis of 203 articles from Annals of Library and Information Studies journal for a period from 2007 to 2012. The highest number of contributions i.e., 43 (21.19 %) were published in the year 2010. It was also found that the most of the contributions 43.35 % belong to two authors. Out of 203 articles, single authors contributed only 72 (35.46 %) articles while 131(64.54 %) articles were contributed by joint authors. The degree of collaboration range from 0.57 to 0.82 and the average degree of collaboration was 0.64.

Velmurugan (2013) [13] carried out a bibliometric analysis on Journal of Intellectual Property Rights (JIPR) for six years between 2007and 2012. The results showed that the highest number of contributions i.e., 56 (19.79 %) were published in 2012. The degree of collaboration in this journal was 0.34. Velmurugan (2014) [14] has analyzed with 546 contributions published in the Indian Journal of Pure and Applied Physics (IJPAP) from 2009 to 2012. The results revealed that the maximum number of contributions i.e., 149 (27.29 %) were published in 2012 whereas the minimum number of 121 (22.17 %) was published in 2011. The degree of collaboration (DC) range, the relative growth rate (RGR) and doubling time (DT) have also been measured. The high number of author productivity i.e., 420 (6.56) was published in 2010.

Velmurugan and Radhakrishnan (2014) [15] have studied the scientometric analysis of the IETE Technical Review Journal during the period 2007 - 2012. The study revealed that the Degree of Collaboration was high i.e. 211 (0.827) in terms of collaborators' contribution. Further, it showed the relative growth rates (RGR) which has increased from 2007 (0.76) to 2012 (1.96) within span of six years and the doubling time (DT) has slightly decreased.

3. Objectives

- To examine the year, author wise and pattern of authors
- To study the author productivity and co-authorship pattern
- To know the source wise documents and distribution of articles across the globe.
- To identify the subject coverage of papers of Library Herald
- To investigate the length of papers published and trace the changes

4. Materials and Methods

For the present study, publications from Library Herald for nine years from 2006 to 2014 were taken. The collected data were typed and recoded in the excel sheet so as to analyze and to retrieve findings of the study. The study covers 9 volumes and 36 issues 252 research publications with related information in terms of year wise distribution, month, volume and issue wise contribution, author wise and pattern of authors, productivity and co-authorship pattern, source wise documents and institution and global wise distribution of articles, subject coverage and the length of papers during the chosen period.

5. Results and Discussion

5.1 Chronology wise articles

Table 1: Year wise Articles

Year	Vol. No	Issues	Papers Published	Cumulative Volume	Total (%)
2006	44	4	38	38	15.07
2007	45	4	33	71	13.09
2008	46	4	22	93	8.73
2009	47	4	18	111	7.14
2010	48	4	27	138	10.72
2011	49	4	25	163	9.92
2012	50	4	22	185	8.73
2013	51	4	44	229	17.47
2014	52	4	23	252	9.13
9 Years	9 Vols	36 Issues	252		100.0

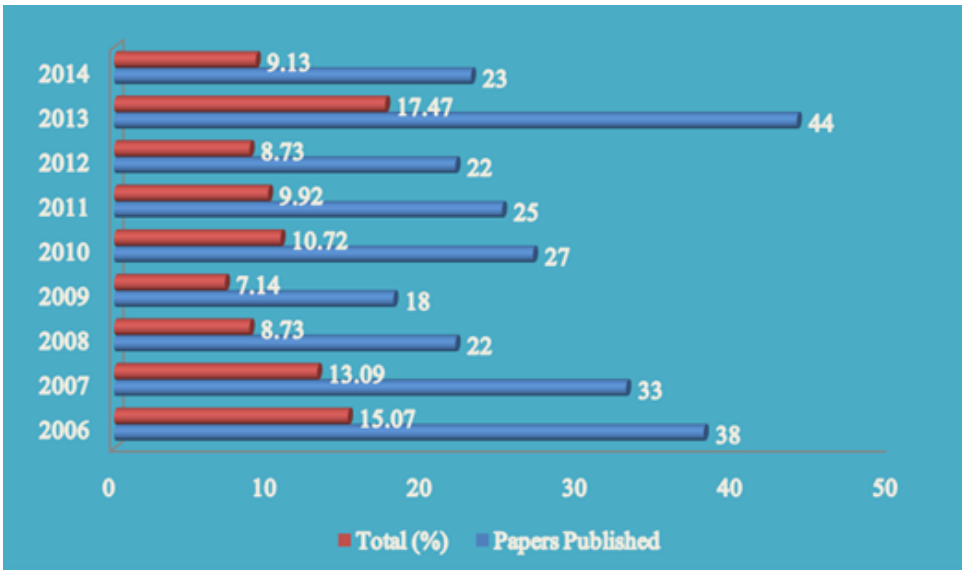

Fig 1: Year wise Articles

Researchers have plan identified the year wise distribution of contributions during the period of study. From the Table 1 (Fig 1) represents that out of 252 articles, the highest number i.e. 44 (17.47%) papers were published in 2013 followed by 38 (15.07%) articles which were published in 2006. The lowest number i.e. 18 (7.14%) papers were published in 2009.

5.2 Month, Volume and Issue wise articles

Table 2: Month and Volume wise articles

Month	Volume and Issue									Total No of Papers	Percentage
	44/1	45/2	46/3	47/4	48/5	49/6	50/7	51/8	52/9		
March	13	9	5	6	7	7	7	6	6	66	26.19
June	9	11	8	6	7	7	6	6	7	67	26.59
September	7	6	4	6	5	5	6	26	4	69	27.38
December	9	7	5	0	8	6	3	6	6	50	19.84
Total	38	33	22	18	27	15	22	44	23	252	100.0

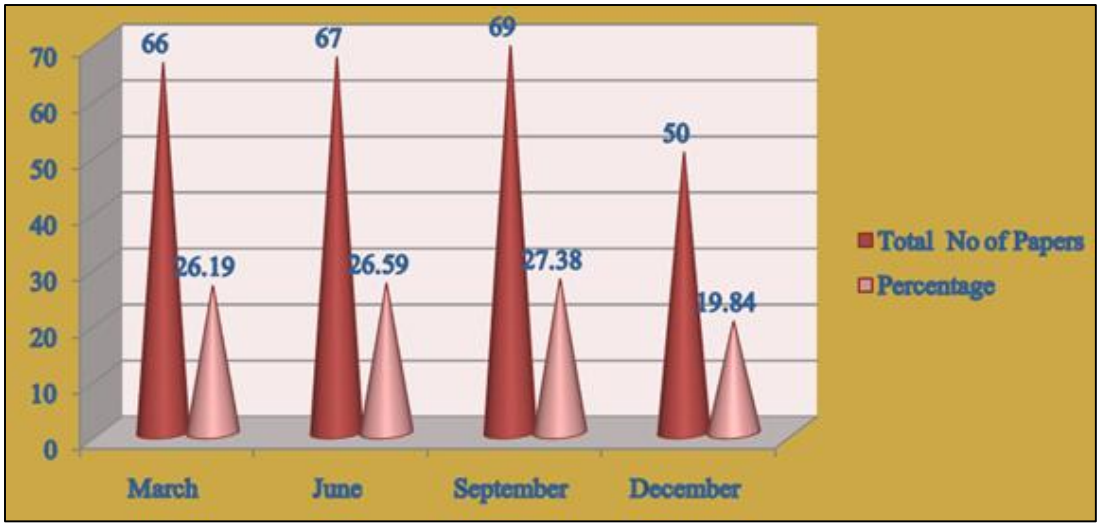

Fig 2: Month and Volume wise articles

Table 2 (Fig 2) indicates the month wise distribution of articles published by the contributors in which the maximum number of 69 (27.38%) were published in September and minimum number of 50 (19.84%) were in the month of December and the average number of contributions were 61.83. Researchers have also noticed the volume wise contribution of distribution in which the maximum numbers i.e. 44 (17.46%) papers were published in the 8th issue of volume 51 and the minimum number of 15 (5.95%) papers were published in the 6th issue of volume number 49 and the average number of contributions as per the volumes and issues were 26.89.

5.3 Year and Volume wise Authorship Pattern

Table 3: Year and Volume wise Authorship Pattern

Year	Volume	Authors				Total Records	Percentage (%) of records
		One	Two	Three	Four		
2006	44	22	15	1	0	38	13.44
2007	45	19	10	4	0	33	12.47
2008	46	9	11	2	0	22	9.05
2009	47	10	5	3	0	18	7.09
2010	48	12	12	3	0	27	11.01
2011	49	12	6	6	1	25	11.24
2012	50	33	7	0	2	42	13.44
2013	51	10	7	5	2	24	11.74
2014	52	10	8	3	2	23	10.52
Total		137	81	27	7	252	100.0
Percentage (%)		54.36	32.15	10.71	2.78	100.0	

Researchers have analyzed year and volume wise authorship pattern during the study period. Table 3 indicates the year wise authorship pattern of contributions. The analysis shows that out of 137 research publications of single author, volume 50 has the maximum number i.e. 33 (24.087%) followed by volume 44 which has the highest number i.e. 22 (32.116%) and volume 46 has the lowest number i.e. 9 (6.57%) and volume 51 and 52 in each 10 were (7.299%) contributed. Out of 81 contributions by two authors, volume 48 has the highest number i.e. 12 (14.814%) and volume 47 has the least number i.e. 5 (6.172%) contributions. Out of 27 contributions by three authors, volume 49 has the maximum number i.e. 6 (22.22%) and volume number 44 has the lowest number i.e. 1 (3.70%) contributions. Out of 7 contributions, volumes 50, 51 and 52 have highest number i.e. each 2 (28.57%) and volume 49 has the least number i.e. 1 (14.28%) contribution. It is interesting to reveal that only four authors are the maximum number of contributors.

5.4 Authorship pattern

There are four types authorship pattern identified such as single, double, three and more than three authors. As per the data from Table 4 Figure 3 depicts that the majority of 137 (54.37%) scientific publications were contributed by solo author and followed by 81 (32.14%) articles were contributed by two authors and the least number of papers 07 (2.78%) were by more than three authors. It was noticed by the researchers that most of the publications were contributed by single authors who were interested and involved in research to contribute their publication.

Table 4: Authorship Pattern

Pattern	Total No of Contributions	Cumulative Value	Percentage
Single Author	137	137	54.37
Double Authors	81	162	32.14
Three Authors	27	81	10.71
More than Three Authors	07	29	2.78
Total	252	409	100.0

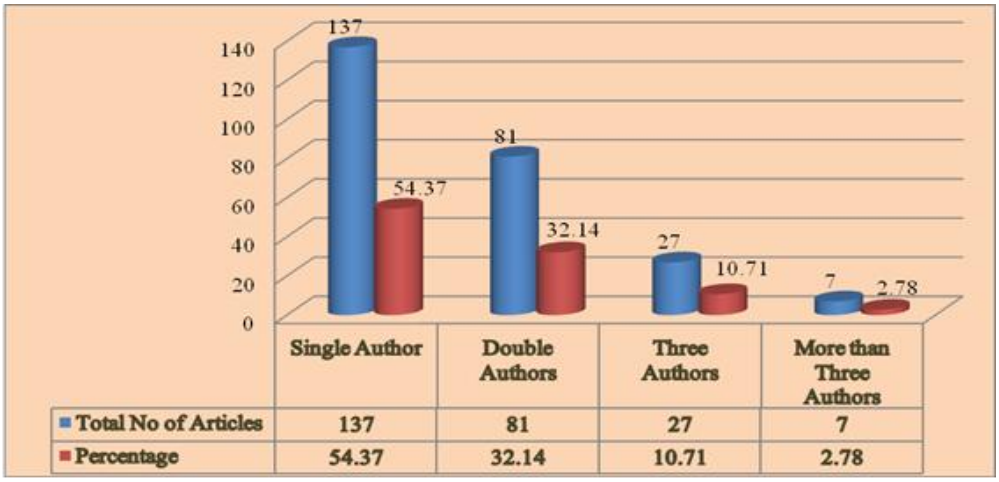

Fig 3: Authorship Pattern

5.5 Single vs Co - Authorship

Co- authorship is often used in bibliometric / scientometric studies to measure research collaboration in academic communities. Table 5 (Fig 4) represents that the single as well as co-authorship pattern on Library Herald journal during the period of study. The study reveals the findings that the highest number i.e. 137 (54.37%) contributors were published by single author whereas the rest of lowest number i.e. 115 (45.63%) papers were published by co-authors. It seems that the most of the papers were contributed by solo author.

Table 5: Single vs Co-Authorship (Year wise)

Pattern	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total No of Papers	Percentage
Single	22	19	9	10	12	12	33	10	10	137	54.37
Co-authors	16	14	13	8	15	13	9	14	13	115	45.63
Total	38	33	22	18	27	25	42	24	23	252	100.0

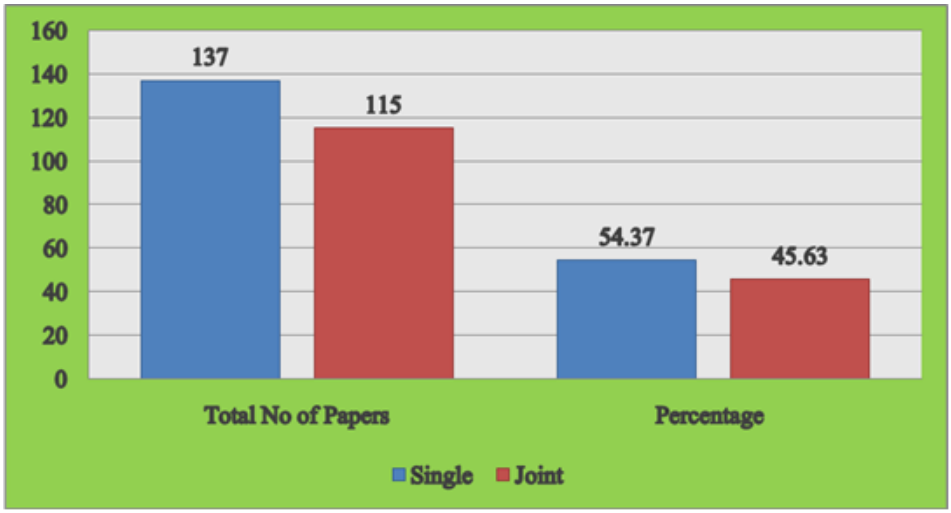

Fig 4: Single vs Co-Authorship (Year wise)

5.6 Authorship Productivity

Researchers have investigated collaborative research work in Library Herald during the period. It was noticed that from the table 6 that only 1.62 have been the average quantity of authors in every document and 0.61 was the normal productivity for each contributor while calculating the maximum quantity of author output i.e. 55 (2.5) in 2012 and 55 (1.44) in 2006 which were found two years with different number of papers.

Table 6: Authorship Productivity

Year	No of papers	No of authors	Average author per paper(AAPP)	Productivity per year
2006	38	55	1.44	0.69
2007	33	51	1.54	0.64
2008	22	37	1.68	0.59
2009	18	29	1.61	0.62
2010	27	45	1.67	0.6
2011	25	46	1.84	0.54
2012	22	55	2.5	0.4
2013	44	48	1.09	0.91
2014	23	43	1.86	0.53
	252	409	1.62	0.61

5.7 Source wise documents

Table 7 (Fig 5) indicates that the source wise distribution of contributors of the journal during the period of study. Out of 2688 articles, the maximum number of contributors have preferred scholarly journals as a source of information that has been placed uppermost position with majority of 807 (30.03%) articles followed by conference proceedings with 665 (i.e. 24.74%), contributions of documents and the minimum number of 23 (0.85%) articles were published as a source of newsletters of this journal during the period of study.

Table 7: Source Documents

Sources	No of papers	Percentage
Scholarly Journals	807	30.03
Conference Proceedings	665	24.74
Books	311	11.57
Thesis & Dissertations	257	9.56
Research Reports	202	7.52
Special Publications	140	5.21
Reference Books	114	4.25
Websites	69	2.56
Abstracts	60	2.23
Annual Reports	40	1.48
News Letters	23	0.85
Total	2688	100.0

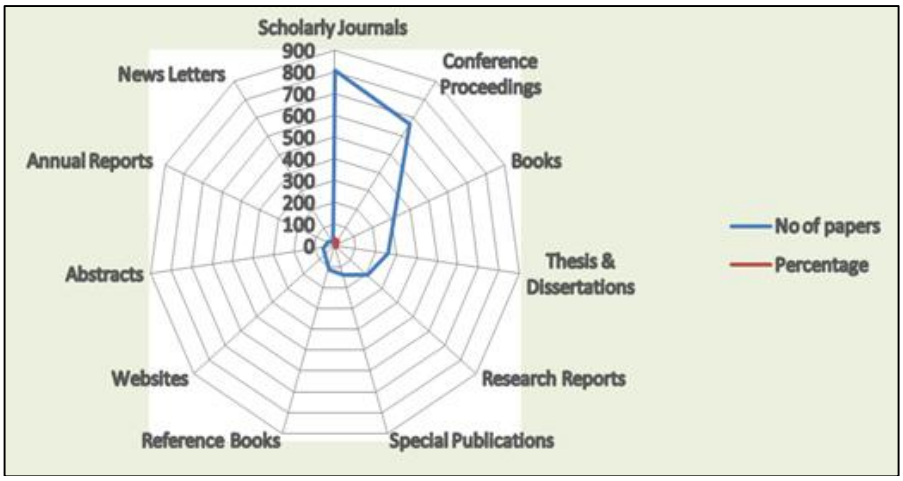

Fig 5: Source Documents

5.8 Institution wise distribution of articles

Table 8: Institution wise distribution of articles

Institution	No of Papers	Percentage	Rank
Academic Institutions	108	42.85	1
R & D Institutions	55	21.83	2
Govt. Reports	45	17.86	3
Other Societies	44	17.46	4
Total	252	100.0	

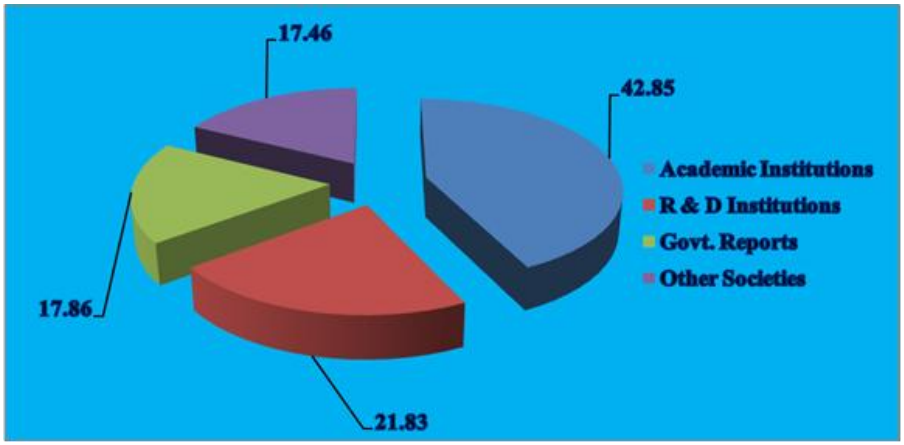

Fig 6: Institution wise distribution of articles

Table 8 (Fig 6) describes that the distribution of the number of articles in each level of institutions by authors. The institutions have been divided into four groups for the expediency of the study in which as Academic institutions, Research and Documentation Institutions, Government reports and other societies. The highest number i.e. 108 42.85% of contributions were from academic institutions which has placed first rank followed by R & D Institutions were placed second position with 55 i.e. 21.83% and the lowest number i.e. 44 17.46% were from other societies which have got the fourth position.

5.9 Global wise distribution of articles

Table 9: Global wise distribution of articles

S. No	Country	Total No of Papers	Percentage
1	India	226	89.68
2	Foreign	26	10.32
Total		252	100.0

Table 9 (Fig 7) shows that the global wise distribution of scientific publications. The findings reveal that out of 252 articles, the maximum numbers of 89.68% documents were published by Indian authors whereas the minimum numbers of 10.32% papers were published by foreign authors.

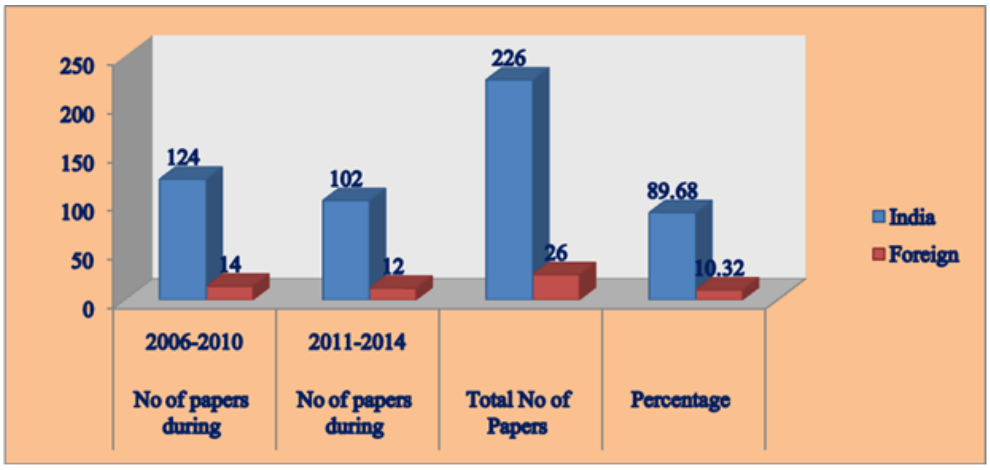

Fig 7: Global wise distribution of articles

5.10 Citation wise distribution of articles

Table 10: Citation wise distribution of articles

Year	No of Articles	No of Citations	Average Citation Per Article (ACPA)
2006	38	382	10.06
2007	33	407	12.33
2008	22	284	12.91
2009	18	156	8.67
2010	27	295	10.92
2011	25	292	11.68
2012	22	224	10.18
2013	44	345	7.85
2014	23	303	13.18
Total	252	2688	10.67

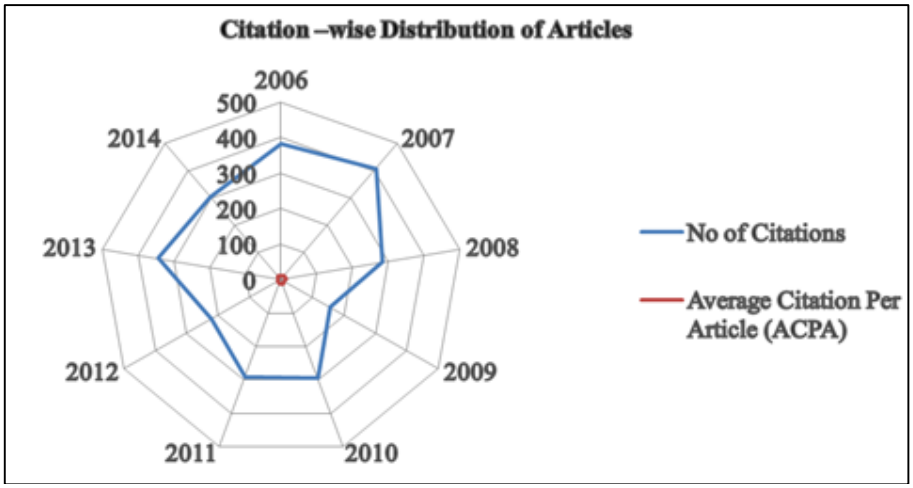

Fig 8: Citation wise distribution of articles

Table 10 (Fig 8) represents that the maximum numbers of (407) citations were found in 2007. The average citation per article was 12.33 and followed by 382 citations in 2006 and the average citation per article was 10.06 in the year 2013, the citations count was 345 and the average citation per article was 7.85. The least number of citations were 156 and the average citation per article was 8.67.

5.11 Length of Papers

Table 11: Length of Papers

Pages	Year									Total	Percentage
	2006	2007	2008	2009	2010	2011	2012	2013	2014		
1-5	5	2	4	5	3	4	18	2	2	45	17.85
6-10	19	13	9	6	11	10	9	8	8	93	36.92
11-15	11	14	7	4	8	11	7	6	5	73	28.96
16 and above	3	4	2	3	5	2	5	8	9	41	16.27
Total	38	33	22	18	27	27	39	24	24	252	100.0

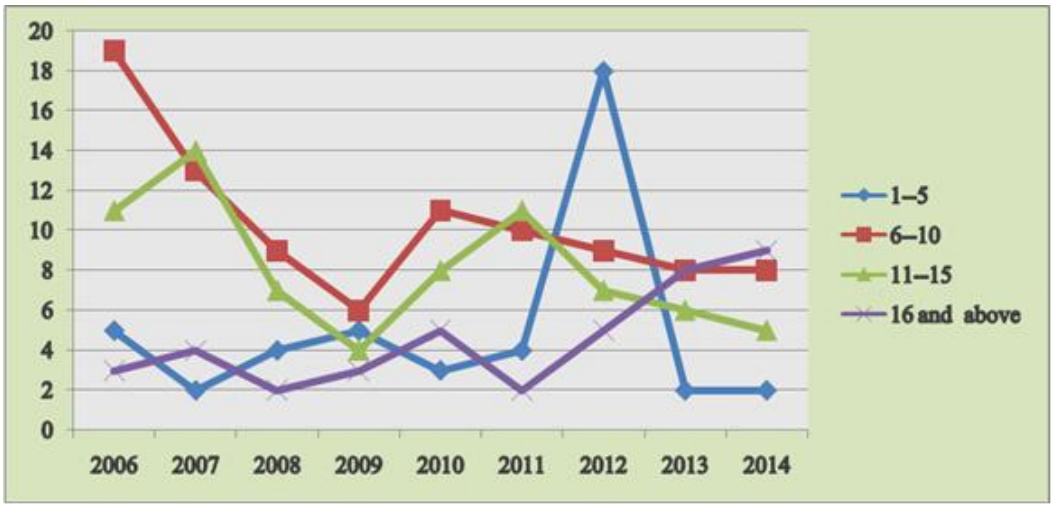

Fig 9: Length of Papers

Table 11 (Fig 9) depicts that out of 252 scientific articles, the highest numbers of (36.92%) articles have the length of 6-10 pages and followed by 73 (28.96%) articles which contain the length of 11-15 pages and the least number of 41 (16.27%) articles range to 16 pages and above.

5.12 Subject coverage of papers

Table 12: Subject wise distribution of papers

Subject	Total No of Papers	Percentage
Library & Info. Science and Information Literacy	40	15.87
LIS Profession, Academic, Special & Public Libraries	27	10.72
Library Automation &Digital Libraries	81	32.15
Internet, Web Technology & Consortia	52	20.63
Bibliometrics Analysis	35	13.88
User Studies	17	6.74
Total	252	100.0

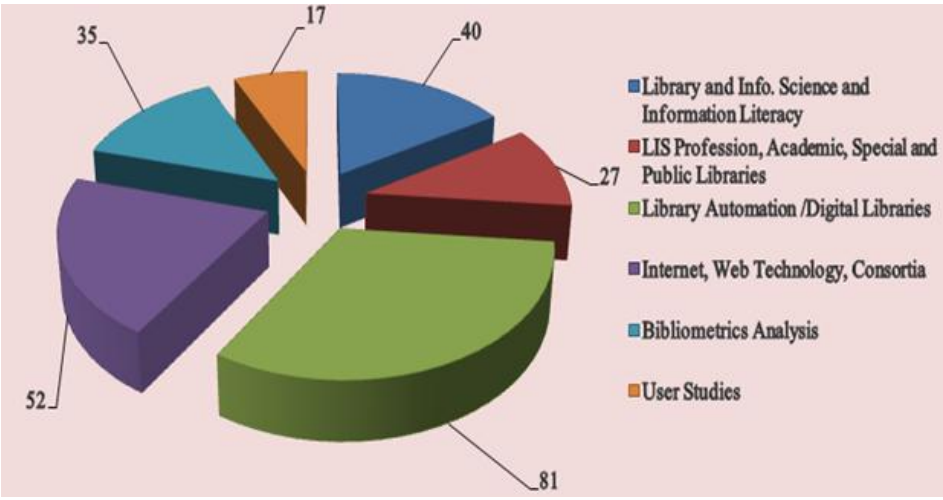

Fig 10: Subject wise distribution of papers

The journal has been publishing the papers related to all aspects of Library and Information Science being used in Libraries and Information Centres. This journal publishes common issues as well as special issues. The common issues focus on the topic of the theoretical aspects for the development of libraries whereas the special issues cover papers in connection with particular theme. Table 12 (Fig10) represents that this journal covers users' studies, bibliometric analysis, library automation, digital libraries, LIS Profession and academic, special and public libraries, Internet, web technology and consortia and also LIS Information Literacy. Based on the study, the findings reveal that out of 252 articles, the highest number of 81 (32.51%) articles cover the recent technology such as Library automation and Digital Libraries and followed by 52 (20.63%) number of articles which cover Internet, Web Technology and Consortia and the lowest number (6.374%) papers focus only user studies.

5.13 Degree of Collaboration (DC)

Table 13: Degree of Collaboration

Year	Single authored	Multi-authored	Total Output	Collaboration
2006	22	16	38	0.421
2007	19	14	33	0.424
2008	9	13	22	0.59
2009	10	8	18	0.44
2010	12	15	27	0.55
2011	12	13	25	0.52
2012	33	9	42	0.21
2013	10	14	24	0.58
2014	10	13	23	0.39
Total	**137**	**115**	**252**	0.45

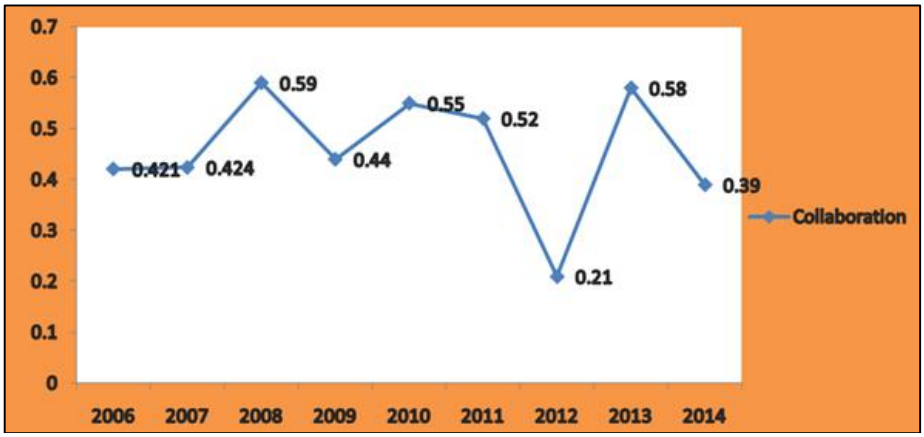

Fig 11: Degree of Collaboration

Table 13 (Fig 11) shows that the degree of collaboration (DC) on authorship in the Library Herald during the period of study. It is very clear that the above analysis shows the percentage of single authored is more than that of multi-authored papers. To estimate the degree of collaboration in quantitative terms, the formula given by K Subramanyam[11] was used.

The formula is : C = Nm/Nm+Ns

Where,

C = Degree of Collaboration

Nm = Number of Multi Authored Contribution

Ns = Number of Single Authored Contribution

Hence, the value of C is = 0.45 (C=137/137+115)

The average degree of collaboration in "Library Herald" is 0.45 which clearly represents that its dominance upon single authored contributions.

6. Findings & Conclusion

The impact of present study has explored and brought out the various factors such as authorship pattern, author productivity, collaboration between single and multi-authors, year, institution, subject, and geographical wise distribution of articles. The major findings of the research are as follows.

- The highest number of contributions were from academic institutions with 108 i.e. 42.85 percentage and occupied first position and the lowest number i.e. 44 (17.46%) were from other societies which have obtained fourth position.
- The maximum number of (89.68%) documents was published by Indian authors and the rest of 26 (10.32%) papers were published by foreign authors. The highest number i.e. (93) 36.92% of articles has the length of 6-10 pages and the least number of 41 (16.27%) articles contain the length of 16 pages and above.
- Out of 252 articles, the highest number i.e. 81 (32.51%) articles covers the technology oriented aspects such as Library automation and Digital Libraries and the lowest number i.e.17 (6.37%) papers focus only user studies.
- The highest number i.e.137 (54.37%) on distribution of contributors was published by single author whereas the remaining 115 (45.63%) papers were published by co-authors.
- The maximum number of 226 (89.68%) documents were published by Indian authors whereas the minimum number i.e. 26 (10.32%) papers were published by foreign authors.
- The maximum number i.e. 407 citations were found in 2007 and the average citation per article was 12.33. The least number of citations were 156 and the average citation per article was 8.67.
- The average degree of collaboration is 0.45 which clearly represents its dominance upon single authored contributions.

7. References

1. Glanzel W. Bibliometrics as a research filed: a course on theory and application of bibliometric indicators, 2003.
2. Pritchard A. Statistical bibliography or bibliometrics. Journal of Documentation. 1969; 2(4):348-349.
3. Library Herald, http://www.indianjournals.com/, 2016.

4. Dhiman AK. Ethnobotany Journal: A ten years bibliometric study. IASLIC Bulletin. 2000; 45(4):177-182.
5. Tiew WS, Abdullah A, Kaur K. Malaysian Journal of Library and information science 1996-2000: A bibliometric study. Malaysian Journal of Library and Information Science. 2002; 6(2):43-56.
6. Aoki M. Analysis of the literature on practice guidelines: a bibliometric study. Journal of Japan Medical Library Association. 2002; 49(1):50-8.
7. Newby GB, Greenberg J, Jones P. Open software development and Lotka's law: bibliometric patterns in programming, Journal of the American Society for Information Science and Technology. 2003; 54(2):169-78.
8. Ian R. Emerald authorship data, Lotka's law and research productivity, Aslib Proceedings, 2005; 57(1):5-10.
9. Verma N, Tamrakar R, Sharma P. Analysis of contribution in Annals of Library and Information Studies. Annals of Library and Information studies, 2007; 54 (2):106-111.
10. Yeoh KH, Kaur K. Subject support in collection development: Using the bibliometric tool. Collection Building, 2008; 27(4):157-166.
11. Thanuskodi S. Library Herald Journal: A bibliometric Study. Journal of Arts; Sciences & Commerce. 2011; 2(4):68-76.
12. Velmurugan C. Bibliometric analysis with special reference to Authorship Pattern and Collaborative Research Output of Annals of Library and Information Studies for the Year 2007 – 2012, International Journal of Digital Library Services. 2013; 3(3):13-21.
13. Velmurugan C. Research Trends in Journal of Intellectual Property Rights (JIPR): A Bibliometric Study, Library Philosophy and Practice (e-journal), Paper 1043. http://digitalcommons.unl.edu/libphilprac/1043 15 July 2016.
14. Velmurugan C. Research Trends in Indian Journal of Pure and Applied Physics (IJPAP) for the year 2009 – 2012, Asian Review of Social Sciences. 2014; 3(1):24-28.
15. Velmurugan C, Radhakrishnan N. Publication Research Trends on Technical Review Journal: A Scientometric Study, International Journal of Digital Library Services. 2014; 4(3):45-55.
16. Subramanyam K. Bibliometric study of research collaboration: a review. Journal of Information Science. 1982; 6:33-38.