

# AUTHORSHIP AND COLLABORATIVE PATTERNS IN THE ANNALS OF LIBRARY AND INFORMATION STUDIES, 2007-2013: A SCIENTOMETRIC STUDY

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## Abstracts

Scientometric analysis of 240 articles published in the Indian Journal Annals of Library and Information Studies during the year 2007-2011 are taken up to observe the distribution of contributions, authorship pattern, Relative growth rate, geographical distribution of contributions and the number of pages used in each volume. Results indicate that highest numbers of papers have been written by co-authors. The contributions in this journal from Delhi are more than those from the other states. The relative growth and popularity of this journal is found to show an upward trend.

**Keywords:** Authorship; Collaborative Patterns; Growth Relative Rare.

## Introduction

Scientometrics is the branch of science that describes the outputs traits in terms of organizational research structure, resource inputs and outputs, develops benchmarks to evaluate the quality of information output. Scientometrics studies characterize the disciplines using the growth of the pattern and other attributes. The scientific measurement of the work of scientists, especially by way of analyzing their publications and the citations. (Khurshid and Sahai1991) there is great consistency among the various bibliometric, Scientometric and Informatics laws. The Bradford law deals with the increased scattering of relevant papers on fixed topic (Bradford, 1934). (Brusilovsky,1978). The Scientometric law concerns the frequency of author's writing papers. (A Lotka, 1926) and (Lyon, 1979) informatic law

concerns the frequency of word occurrence. Before embracing on a research project in bibliometric, Scientometric and Informetric distributions and laws, it is imperative to know what has been done previously in this area. The techniques of scientometrics and bibliometrics are closely similar their different roles are distinguished by their very different contexts (Natarajan, 2010). The purpose of this bibliography is to provide a list of articles and other pertinent publications, so as to facilitate work of other researchers in this field.

### Review of literature

(Pradhan, Panda and Chandrakar, 2011) The study presents the trends in authorship pattern and author's collaborative research in Indian chemistry literature with a sample of 53,977 articles downloaded from SCI-Expanded database in Web of Science during the period 2000-2009. The average number of authors per article is 3.55 %. In the study the degree of collaboration (C) during the overall 10 years (2000-2009) is 0.03, but the year wise degree of collaboration is almost same in all the years of mean value 0.97. In the 10 years of period, the multi-authorship articles are higher and predominant on single authorship. The study found that the researchers in chemistry are keen towards team research or group research rather than solo research.

(Khaparde and Pawar, 2013) Studied the trends in authorship pattern and author's collaborative research in Information Technology with a sample of 17917 articles collect from LISA during the period of 2000-2009. The average number of authors per article is 1.80. In the study the degree of collaboration (C) during the overall 10 years (2000-2009) is 0.71 but the year wise degree of collaboration is almost same in all the years of mean value 0.49. In the 10 years of period, the multi- authorship articles are higher and predominant on single authorship. The study found that the researches in Information Technology are keep toward team research or group research rather than solo research.

(Thavamani and Kotti, 2013) bibliometric techniques were applied to analyze the authorship trend in the "Chinese Librarianship: an International Electronic Journal (CLIEJ)" during the period of 1996-2013. A total of 133 articles and 221 authors in the Journal were examined by year and volume to ascertain authorship patterns, author productivity, and degree of collaboration. The average number of authors per paper is 1.661% and the average productivity per author is 0.601%. The average degree of collaboration is 0.443 during the period under study.

### Source of the journal

Annals of Library and Information Studies is a leading quarterly journal in library and information studies publishing original papers, survey reports, reviews, short communications, and letters pertaining to library science, information science and computer applications in these fields. In the year 1954, erstwhile INSDOC launched Annals of Library Science as its first publication and Dr. S R Ranganathan was its first Editor. The

journal's title was expanded to Annals of Library Science and Documentation in 1964 and again renamed in 2001 as Annals of Library and Information Studies. Into its 59th volume in 2012, Annals of Library and Information Studies is the oldest LIS Indian journal. (<http://op.niscair.res.in/index.php/ALIS>). The articles published in this journal cover all areas of research Library and information science and so on.

### **Objectives of this study**

The objectives of the present study are as follows:

1. To study research article contributions by year and volume.
2. To study research article contributions by Issue-Wise.
3. To study authorship patterns by Volume-Wise.
4. To study author productivity.
5. To identify degree of author collaboration, and
6. To find out the Relative Growth Rates [R(c)] and Doubling Time [Dt(c)] for publication.
7. To identify Geographical distribution of contributions by state.
8. To determine contributor's institution – wise.
9. To find out Average citation per contribution in Each Volume .
10. To determine the number of pages used in different volumes.

### **Scope of this study**

An attempt has been made to analyse the contributions in 28 issues of 7 volumes of Annals of Library and Information Studies journal in the field of library and information science during the year from 2007-2013.

### **Methodology**

The data pertaining to Annals of Library and Information Studies journal regarding 240 contributions made from volume 54 in 2007 to volume 60 in 2013. The authorship pattern has been analyzed by using K. Subramanian's degree of collaboration in quantitative terms. All the data were subsequently examined observed, analyzed and tabulated for making observations.

## Data Analysis

### 1. Distribution of contributions (Year and Volume-wise)

Table 1. Contribution of Research Articles by Year and Volume

Sl. No.	Year	Vol. No	No of issue	No of contributions	%
1	2007	54	4	28	11.67
2	2008	55	4	35	14.58
3	2009	56	4	34	14.16
4	2010	57	4	43	17.92
5	2011	58	4	36	15
6	2012	59	4	27	11.25
7	2013	60	4	37	15.42
<b>Total</b>			<b>28</b>	<b>240</b>	<b>100</b>

Graph 1. Contribution of Research Articles by Year and Volume

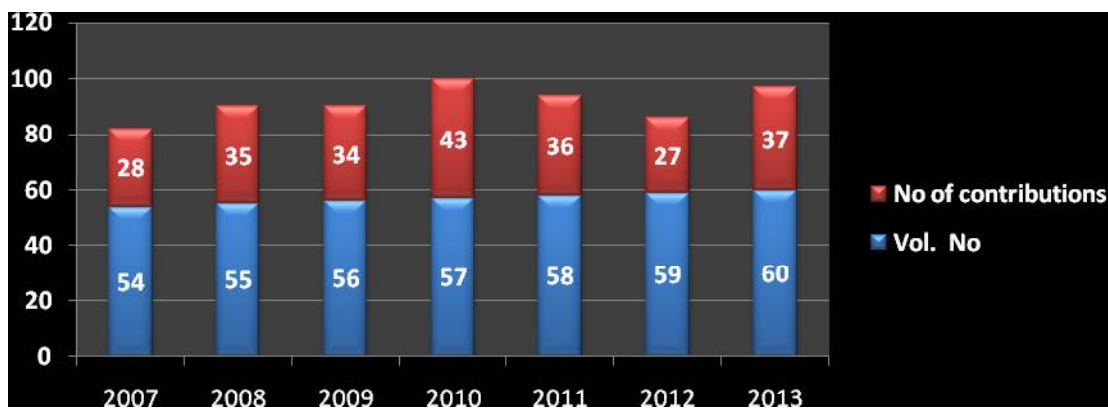


Table 1 and Graph 1 show the growth of research articles published in the *Annals of Library and Information Studies* from 2007 to 2013. Altogether, there are 240 research articles. The highest number of research articles (43, 17.92%) was published in 2010 and 2013 while the lowest number (28, 11.67%) of research articles in the year of 2007.

## 2. Distribution of contributions (Issue-wise)

Table 2. Contribution of Research Articles by Issue and Volume

Sl. No.	Volume Number							
	Issue No	54	55	56	57	58	59	60
1	1	6	9	7	9	10	6	9
2	2	9	10	8	9	10	6	9
3	3	6	9	9	15	9	8	9
4	4	7	7	10	10	7	7	10
<b>Total</b>		<b>28</b>	<b>35</b>	<b>34</b>	<b>43</b>	<b>36</b>	<b>27</b>	<b>37</b>

Graph 2. Contribution of Research Articles by Issue and Volume

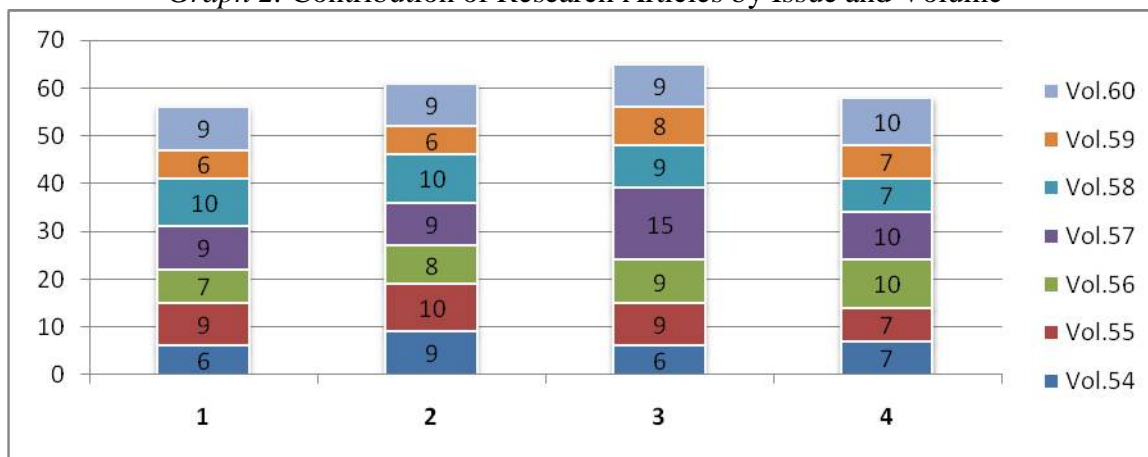


Table 2 and Graph 2 exhibited issue-wise contributions in *Annals of Library and Information Studies* from 2007 to 2013. Volume no: 57, shows the highest number of total contributions. Whereas the volume no: 54 have recorded the lowest number of total contributions.

## 3. Authorship Productivity.

Table 3. Author's Productivity

Sl. No.	Authorship	No. of Papers	%	No. of Authors	%	AAPP*	Productivity per Author
1	Single	86	35.83	86	21.88	1.000	1.000
2	Two	105	43.75	184	46.82	1.752	0.571
3	Three	45	18.75	113	28.75	2.511	0.398
4	More than three	4	1.67	10	2.55	2.500	0.400
<b>Total</b>		<b>240</b>	<b>100</b>	<b>393</b>	<b>100</b>	<b>1.941</b>	<b>1.941</b>

Notes: \*Average Authors per Paper (AAPP) = Number of authors/Number of papers.  
Productivity per author = Number of papers/Number of authors.

Graph 3. Author’s Productivity

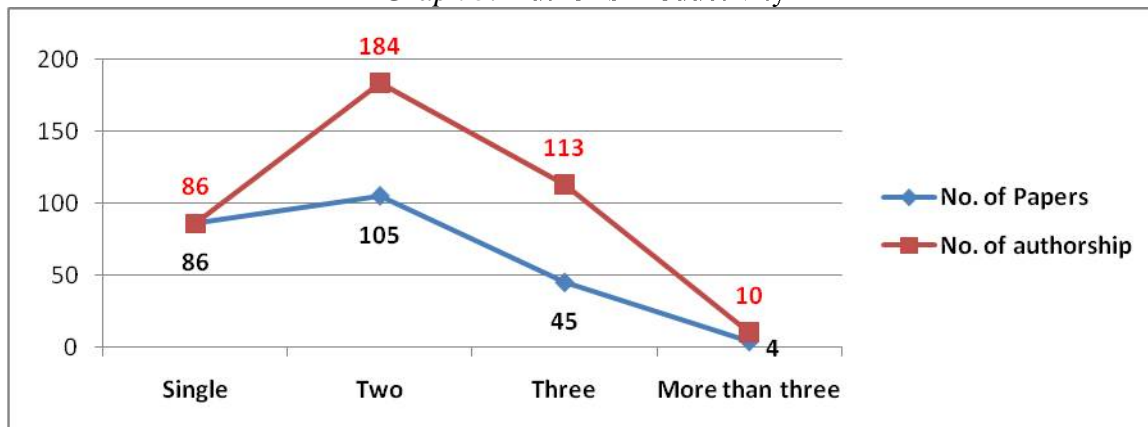


Table 3 and Graph 3 show the data related to author’s productivity. The total average number of authors per paper is **1.941** and the average productivity per author is **1.941**. The highest number of author’s productivity (184, 46.82%) was in co-authors. The minimum number of author’s productivity (10, 2.500%) was in more than three authors.

**4. Authorship pattern of contributions (Volume - Wise).**

Table 4. Authorship Patterns by Volume-Wise

Sl. No.	Year	Vol. No	Authors per Article				Total No. of Papers (%)
			Single	Two	Three	More than Three	
1	2007	54	13	10	5	-	28 (11.67)
2	2008	55	12	15	7	1	35 (14.58)
3	2009	56	6	20	8	-	34 (14.16)
4	2010	57	17	19	7	-	43 (17.92)
5	2011	58	13	15	7	1	36 (15)
6	2012	59	12	9	6	-	27 (11.25)
7	2013	60	13	17	5	2	37 (15.42)
Total			86	105	45	4	240 (100%)

Table 4 depicts that authorship pattern of contributions volume-wise. Regarding contributions by a single author, volume no 57 records the highest percentage. Regarding the two author and three authors and more than three author’s contributions, Volume No 56

shows the maximum percentage. Anyhow it may be concluded that the Co-author contributions has the maximum percentage.

### 5. Degree of collaboration in Annals of library and information studies

The formula given by K Subramanian is useful for determining the degree of collaboration in quantitative terms. The study followed the same formula which is mathematically put as:

$$C = \frac{NM}{NM+NS}$$

Where C= Degree of collaboration

NM= Number of Multi authored papers.

NS=Number of single authored papers

Table 5. Shows degree of collaboration

Number of authors' publications	Number of publication	Percentage for total publications	Value of per $C = \frac{NM}{NM+NS}$
Number of personal author publications	393	-	
Number of single author publications	86 (N <sub>s</sub> )	21.88	0.78
Number of co-authors publications	307 (N <sub>m</sub> )	78.12	
Two authors publications	184	46.82	0.47
Three authors publications	113	28.75	0.28
Three authors publications	10	2.55	0.03

From table 5 there were 21.88 percent were written by single authors, 78.12 percent belonged to co-authors. The degree of collaboration among the co-authors was maximum (0.47) in articles written by more than three and more than three authors, 0.28 and 0.03, respectively. Therefore the authors prefer to work jointly.

The average degree of author collaboration in of Library and Information Studies from 2007 to 2013 is 0.78, which clearly indicates its dominance upon multi authored contributions.

### 6. Relative Growth Rate [R(P)] and Doubling Time [Dt(p)] for Publications:

#### ➤ Relative Growth Rate (RGR):

The Relative Growth Rate (RGR) is the increase in number of articles/ pages per unit of time. This definition is derived from the definition of relative growth rates in the study of growth

analysis of individual plants and effectively applied in the field of Botany Hunt (1919), Blackman (1919) defined, which in turn had its origin from the study of the rate of interest in the financial investment. The mean Relative Growth rate (R) over the specific period of interval can be calculated from the following equation.

R

$$1-2 = \text{Loge } 2 W - \text{loge } IW$$

Whereas,

1-2 R = mean relative growth rate over the specific period of interval.

Loge IW = log of initial number of Articles.

Loge 2 W = log of final number of articles after a specific period of interval.

2 T - 1 T = the unit difference between the initial time and final time.

The year can be taken here as the unit of time. The RGR for articles is hereby circulated.

Therefore,

1-2 (aa-1 year-1) can represent the mean relative growth rate per unit of year over a specific period of interval.

➤ **Doubling Time (Dt)**

There exists a direct equivalence between the relative growth rate and the doubling time. If the numbers of articles/pages of subject double during a given period then the difference the logarithms of numbers at the beginning and end of this period must be logarithms of number 2. If natural logarithm is used this difference has a value of 0.693. Thus the corresponding doubling time for each specific period of interval and for both articles and pages can be calculated by the formula,

$$\text{Doubling time (Dt)} = \frac{0.693}{R(p)}$$

Therefore,

$$\text{Doubling time for articles } D(t) = \frac{0.693}{1-2 R (aa-1 \text{ year-1})}$$

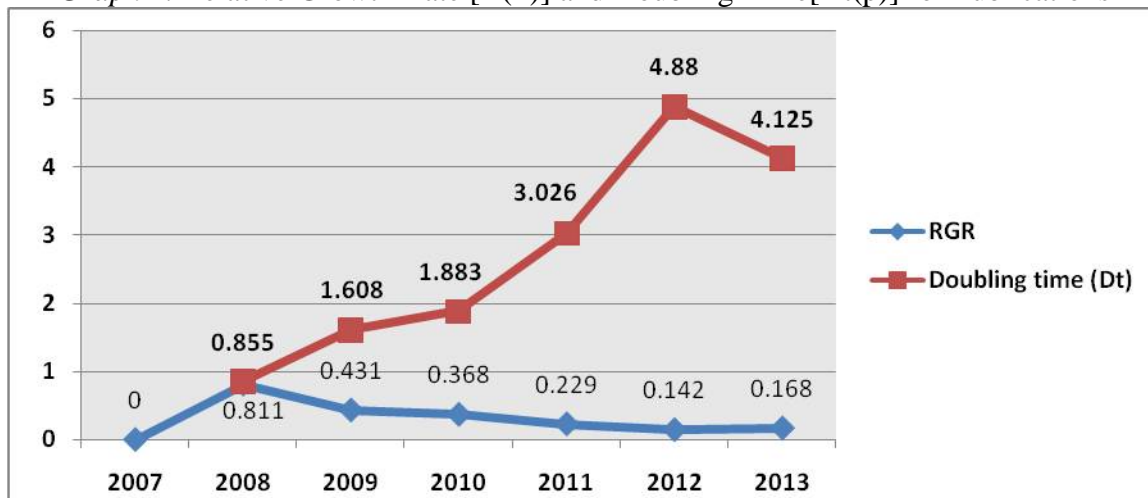
Table 6. Shows Relative Growth Rate [R(P)] and Doubling Time [Dt(p)] for Publications

Sl. No.	Year	No. of Output	Cumulative	W1	W2	RGR	Doubling time (Dt)
1	2007	28	28	-	3.332	-	
2	2008	35	63	3.332	4.143	0.811	0.855
3	2009	34	97	4.143	4.574	0.431	1.608
4	2010	43	140	4.574	4.942	0.368	1.883



5	2011	36	176	4.942	5.171	0.229	3.026
6	2012	27	203	5.171	5.313	0.142	4.880
7	2013	37	240	5.313	5.481	0.168	4.125
<b>Total</b>		<b>240</b>	<b>947</b>	/	/	<b>Mean (0.307)</b>	<b>Mean (2.339)</b>

Graph 4. Relative Growth Rate [R(P)] and Doubling Time [Dt(p)] for Publications



From table 6 and graph 4 It is observed that its relative growth rates have decreased gradually from 0.811 in 2007 to 0.168 in 2010. The whole study period records the mean relative growth rate of **0.307**. Contrarily, the doubling time for publication of all sources of output has increased from 0.855 in 2007 to 4.125 in 2010. The doubling time for publications at the aggregate level has been computed as **2.339** years.

**7. Contributor’s institution – wise**

Table 7. Contributor’s institution – wise

Sl. No.	Year	Vol. No	University	Institute	College	Not Mentioned	Total
1	2007	54	17	5	3	3	28
2	2008	55	22	11	1	1	35
3	2009	56	18	8	6	2	34
4	2010	57	22	14	3	4	43
5	2011	58	22	10	3	1	36
6	2012	59	17	10	0	-	27
7	2013	60	21	14	2	-	37
<b>Total</b>			<b>139 (57.92%)</b>	<b>72 (30%)</b>	<b>18 (7.5%)</b>	<b>11 (4.58%)</b>	<b>240</b>

Graph 5. Contributor’s institution by Volume-Wise

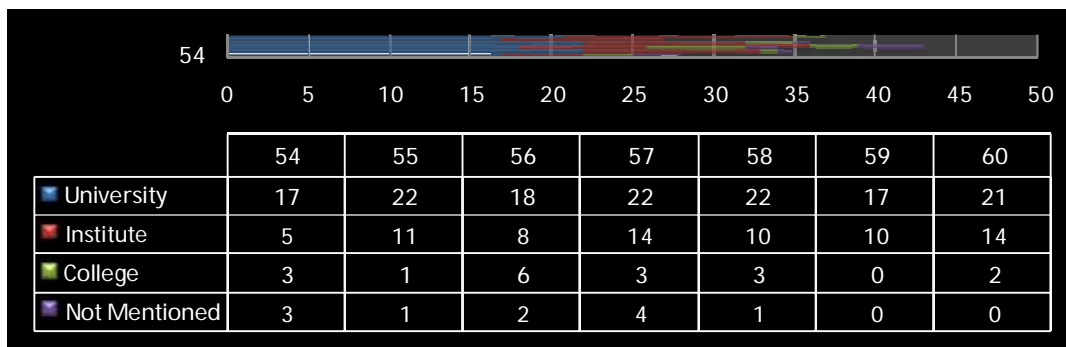


Table 7 and graph 5 depicts the geographical distribution of Contributions, it found that, the majority of contributors 139 (57.92%) belong to university at, followed by contributors belonged to 72 (30%) institutions and 18 (7.5%) colleges, respectively.

**8. Geographical distribution of contributions at national level**

Table 8. Authorship by State

Sr. No	Name of the state	No of contributions	Average
1	Delhi	60	India(9.68)
2	Karnataka	29	
3	Kerala	21	
4	West Bengal	20	
5	Maharashtra	15	
6	Varanasi	13	
7	Tamil nadu	13	
8	Kota	9	
9	Uttar Pradesh	7	
10	Madhya Pradesh	7	
11	Chandigarh in Haryana and Punjab	3	
12	Jammu and Kashmir	3	
13	Punjab	2	
14	Manipur	2	
15	Andhra Pradesh	2	
16	Gujarat	1	
17	Meghalaya	1	
18	Odisha	1	
19	Chhattisgarh	1	
20	Himachal Pradesh	1	
21	Haryana	1	

22	Jharkhand	1	Nigeria(1.13)
23	Ogun	2	
24	Ijebu-Ode	1	
25	Kano	1	
26	Lagos	1	
27	Abia	1	
28	Anambra	1	
29	Borno	1	
30	Zaria	1	
31	Dhaka-Bengladesh	4	
32	Solon- USA	2	
33	Others	8	
34	Not mentioned	4	
/	Total	240	

Table 8 show the distribution of authors by state. The 240 research articles were contributed by 393 authors from more than 32 states. Whereas, the Nigeria was taken as the second country published by authors in Annals of Library and Information Studies from 2007 to 2013 with average of 1.13. The highest numbers of authors were from the India with average of 9.68. The most published authors in India from Delhi state, followed by Karnataka , Kerala, and West Bengal . The lowest number of contributions was from Dhaka (Bengladesh) and Solon (USA), respectively.

### 9. Average citation per contribution in Each Volume

Table 9. Shows citation per contribution in Each Volume

Sl. No.	Vol. No	No of Contributions	No of Citations	%
1	54	28	317	7.30
2	55	35	503	11.59
3	56	34	543	12.51
4	57	43	919	21.17
5	58	36	776	17.88
6	59	27	465	10.71
7	60	37	818	18.84
<b>Total</b>		<b>240</b>	<b>4341</b>	<b>100</b>

Graph 9. Citation per Contribution in Each Volume

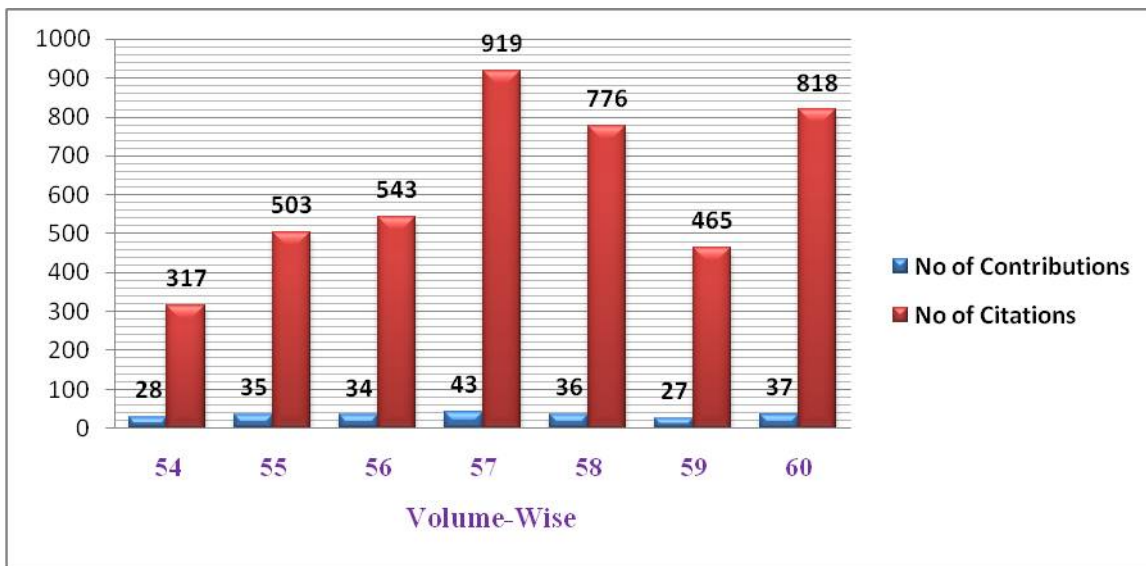


Table 9 and Graph 9 show the average citation per contribution in each volume. Total 240 contributions were contributed. Maximum No. 919 (21.17) of citations was contributed in volume No.57. followed by 818 citations in volume No.60. And the minimum number 317(7.30) of citations were contributed in volume No. 54.

**10. Average pages (per volume and per contributions).**

Table 10. Average pages (per volume and per contributions).

Sl. No.	Vol. No	No of Articles	Total Pages	%
1	54	28	220	10.07
2	55	35	333	15.24
3	56	34	297	13.59
4	57	43	416	19.04
5	58	36	361	16.52
6	59	27	264	12.08
7	60	37	294	13.46
<b>Total</b>	<b>7 (volumes)</b>	<b>240</b>	<b>2185</b>	<b>100</b>

Table 10 shows that 28 research articles in Vol.54 covered 220 pages; 35 articles in Vol.55 covered 333 pages; 34 articles in Vol.56 covered 297 pages; 43 articles in Vol.57 covered 416 pages; 36 articles in Vol.58 covered 361 pages; 27 articles in Vol.59 covered 264 pages; and 37 in Vol.60 covered 294 pages, respectively. But in the study it was seen that 43 (19.04%) articles had the maximum number of pages.

**Conclusion:**

The publishing trend totally depends on the productivity of contributors, pattern of

contributions and the quality of information. The year 2010 shows the maximum of contributions 43(17.92%) made in *Annals of Library and Information Studies* journal. A significant note of the study is that the majority of the articles are contributed by co-author 307 (78.12), the majority of contributors 139 (57.92%) belong to university. In India, Delhi dominates as the number one of contributions than any other states. Maximum No. 919 (21.17) of citations were contributed in volume No.57. 43 (19.04%) articles had the maximum number of pages. A notable attribute of this study is that, this journal really stipulates / induces fruitful research for the researchers. Today, we see that research is done in almost all the branches of knowledge, especially in science and technology.

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