

Scientometric Analysis of Annals of Library and Information Studies (ALIS)

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Abstract: *Scientometrics is a technique and tools used to measure quantitative scientific activity and productivity of publication. This paper provides a critical scientometric analysis of 231 research articles published in the journal Annals of Library and Information Studies (ALIS) during the 2011-2017. The study focuses on the various aspects of the journals with respect to scientometric techniques such as distribution of article, annual growth rate, authorship pattern, author's productivity, degree of collaboration, collaborative index, countrywise distribution of articles and citation analysis. The study shows that maximum numbers of 38 articles were published in the year 2015 with 16.45% sharing. Out of 231 articles 82 (35.50%) articles were contributed by the single authors. Overall average authors per paper, average degree of collaboration, average collaborative index and average citation per paper were 1.91, 0.77, 2.37, and 20.01 respectively. Remarkable contributors are from India with 74.21% percent sharing.*

Keywords: Scientometrics, Bibliometrics, Authors productivity, Citation analysis, Collaborative Index

1. Introduction

Scientometrics is a quantitative technique and tools used to measure scientific activity of publication. It is the statistical method for evaluating research output and productivity of a research organization, publication of particular subject area and research activities or research growth on particular literature. Now a days it is also used to measure and to analyze growth and utility of publication in a particular journal. This paper focuses on quantitative study of Annals of Library and Information science (ALIS) journal by using scientometric technique and highlights the various facets of the scholarly content published by this journal such as publication and authorship pattern, geographical distribution of authors, reference distribution, growth rate, degree of collaboration, collaborative index, average author per papers etc. during 2011-2017 periods.

2. Review of Literature

For conducting this study and analyzing the data a number of previous studies have been carried out to explore this scientometric study. Velmurugan and Radhakrishnan [1] conducted 7 years productivity study of in Malaysian Journal of Library and Information Science for a period between 2008 and 2014. They concluded that highest number of author productivity of this research 74 (2.64%) were published in the year 2011. The majority of 31.84% contributions from Malaysia which is the first position, followed by 11.31% were contributed by authors from Iran is the second rank and 11.01% of contributions came from India is the third position. Gupta and Hasan [2] made the Scientometric analysis of 200 research article published in the journal, "Metamorphosis: A Journal of Management Research" from year 2002 to 2016. Out of 200 papers, 114 (57%) were published by single authors whereas 86 out of 200 (43%) were contributed by joint authors. During study period it is found that the overall average degree of collaboration i.e. 0.43, average collaborative index i.e. 2.35 and average citation per paper i.e. 25.59.

Bala and Singh [3] critically analyses 316 scholarly communications published in the Indian Journal of Biochemistry & Bio-Physics. Study reveals that single author contributed 18 (5.7%) while the rest of 162 (51.3%) articles were contributed by Multi authors. The majority of 768 (68.9%) contributions from India which is the first position, followed by 170 (14.9%) were contributed by authors from China. Batcha [4] et al. conducted study of 227 articles published in DESIDOC Journal of Library & Information Technology (DJLIT) during the period 2013-2017. The majority of articles i.e. 111 (50%) were published by two authors and with 0.69 percentage of degree of collaboration. The average number of authors per articles found in the study was 9.65 and the average productivity per author for articles was 2.59. Rajendran [5] et. al. (2011) made study of 633 research articles published in Journal of Scientific and Industrial Research. Out of 633 contributions of authors, only 51 articles are single authored and rest of the articles by multi authored with degree of collaboration i.e. 0.92. The study also revealed that the author productivity is 0.34 and dominated by the Indian authors in contricution with 462 (72.99%). Pratap and Srivastava [6] evaluate the publications of Library Trends 1980-2017 using Scopus database published by Elsevier. The study shows that most of the papers 1092 (72.80%) were single authors followed by 408 (27.2%) multi-authors papers. Out of the top most 15 different countries, United State contributed the highest number of articles 1136 out of total contributions and scored first rank.

3. Objectives

The objectives of the study include:

- To assess year wise distribution of articles.
- To determine the authorship pattern&distribution of the articles.
- To find out the annual growth rate (AGR) of research articles.
- To find out the degree of collaboration (DC) and collaborative index (CI) of the journal.
- To identify the country wise distribution of publications.
- To analyse the year wise citation pattern.

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4. Objectives

The data required for this research has been taken from the published volumes of journal ‘Annals of Library and Information Studies’ which is published by NISCAIR, New Delhi and also from the journal repository website (<http://nopr.niscair.res.in/handle/123456789/66>).

The bibliometric and scientometric method is used to analyses and to study the attributes of the articles published in Annals of Library and Information Studies journal form 2011-2017. Seven volumes (Vol. 58 to 64) containing 28 issues and 231 articles were considered for the scientometric analysis. The analysis of research data has been collected, organized, analyzed and statistical calculation and graphical representation have been done using Microsoft Excel application software.

5. Result and Discussion

5.1 Year wise Distribution of Articles

Table 1 provides the Year wise chronological distribution of articles publications of the study span. Out of 231 publication published during the period 2011-2017, the maximum number of 38 (16.45 per cent) papers were published in volume 62 in 2015 followed by 2013 (16.02 per cent), 2011 (15.58 per cent) and 2014 (14.72 per cent), respectively. The minimum numbers of 27 (11.69 per cent) papers were published in 2012. Thus on average 33 articles were published per year during 2011-2017 span.

Table 1: Year wise Distribution of Articles

Year	Vol. No.	Issue	No. of Articles	% age	Cumulative%
2011	58	4	36	15.58	15.58
2012	59	4	27	11.69	27.27
2013	60	4	37	16.02	43.29
2014	61	4	34	14.72	58.01
2015	62	4	38	16.45	74.46
2016	63	4	31	13.42	87.88
2017	64	4	28	12.12	100
			231	100.00	

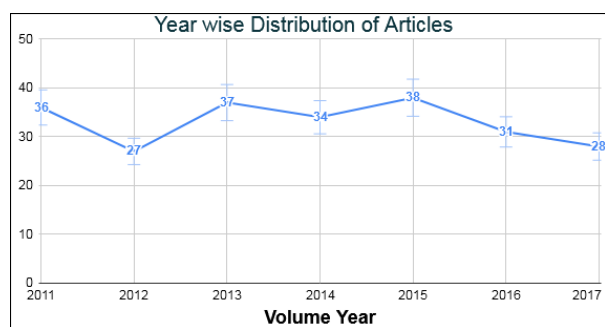


Figure 1: Year wise Distribution of Articles

5.2 Authorship Pattern

Table 2 shows a complete authorship pattern of article published during 2011-2017. Out of 231 contributions, 104 (45.02 %) were contributed by double authors followed by 82 (35.50 %) by single author, 45 (19.48 per cent) by triple and more than three authors respectively.

Table 2: Authorship Pattern

Authorship Pattern	Total Contribution	Cumulative Value	% age
Single	82	82	35.50
Double	104	186	45.02
Triple and more	45	231	19.48
Total	231	231	100

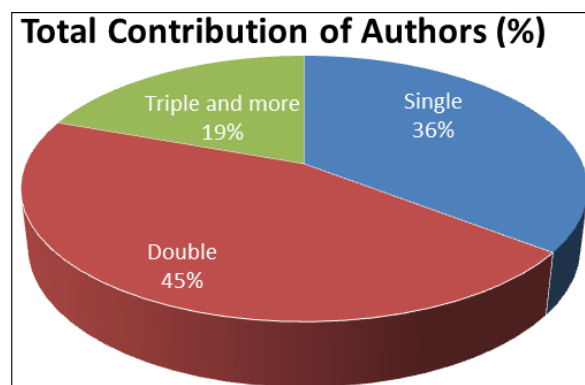


Figure 2: Contribution of Author

5.3 Authors Contribution

Table 3 shows that the maximum number of articles were contributed in joint authorship (Co-authorship) with 149 (64.50%) records out of 231 total items and 82 (35.50%) articles were authored in the single authorship pattern which is less in comparison to joint authorship pattern. More than 50 per cent articles were published in joint authorship as same result found in Kashyap [7] and Nattar [8] et. al. study.

Place table titles above the tables.

Table 3: Authorship Pattern – Solo and Co-authorship Contributions

Pattern	2011	2012	2013	2014	2015	2016	2017	No. of Articles	% age
Single	14	11	12	12	18	7	8	82	35.50
Joint	22	16	25	22	20	24	20	149	64.50
	36	27	37	34	38	31	28	231	100

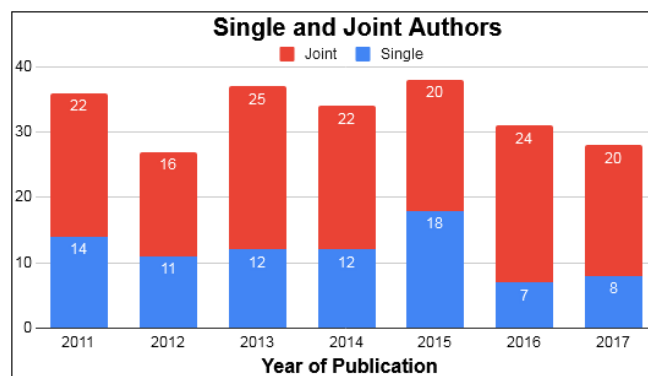


Figure 3: Authorship Pattern

5.4 Author Productivity

Table 4 shows that overall productivity of per author and average author per paper (AAPP) year wise during span 2011-2017. The average authors calculated the AAPP and productivity per author by using formula as follows.

$$\text{AAPP per author} = \frac{\text{Number of Author}}{\text{Number of Papers}}$$

$$\text{Productivity per Author} = \frac{\text{Number of Papers}}{\text{Number of Authors}}$$

The maximum AAPP at 2.12 with minimum productivity per author at 0.46 in the year 2016 and the minimum AAPP as 1.76 with maximum productivity per author is 0.56 in the year 2015.

Table 4: Authors Productivity

Year	Total Articles	Authors	AAPP*	Productivity per Author
2011	36	69	1.91	0.52
2012	27	49	1.81	0.55
2013	37	74	2.00	0.50
2014	34	63	1.85	0.53
2015	38	67	1.76	0.56
2016	31	66	2.12	0.46
2017	28	54	1.92	0.51
Total	231	442	1.91	0.52

*AAPP- Average Author Per Papers



Figure 4: Yearwise Authors Productivity

5.5 Year wise Single and Multi Authored Papers

Table 5 represents the distribution of year wise single and multi-authored papers. Out of 231 research offerings, 82 articles are single authored, while the rest 149 papers were contributed by joint authors. It is analysed that the maximum research articles were published by multi authors.

Table 5: Year wise Single and Multi Authored Papers

Year	Single Author Papers (%)	Multi Author Papers (%)	Total Papers	Cumulative %
2011	14	22	36	15.58
2012	11	16	27	11.69
2013	12	25	37	16.02
2014	12	22	34	14.72
2015	18	20	38	16.45
2016	7	24	31	13.42
2017	8	20	28	12.12
Total	82	149	231	100

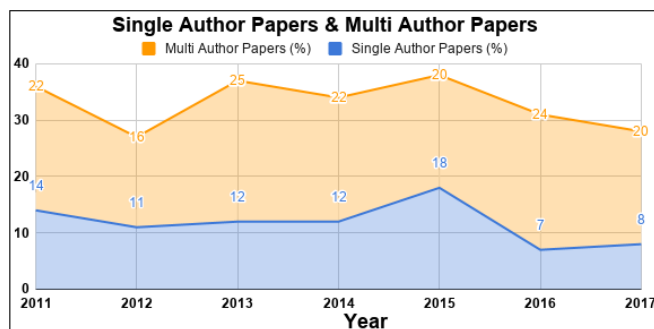


Figure 5: Yearwise Single & Multi Author Papers

5.6 Degree of Collaboration

Table 6 shows that the degree of collaboration of authors in article publication. The degree of collaboration is defined as the ratio of the number of collaborative research papers to the total number of research papers in the discipline during the certain period of time. It is calculated by using the formula suggested by the Subramanyam [9].

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

where C is degree of collaboration in discipline, Nm is number of multi-authored papers in the discipline published during a year, and Ns is number of single authored papers in the discipline published during a year. From Table it is clear that the highest value of DC 0.77 was observed in the year 2016 followed by 0.71 in years 2017 and the lowest value of 0.52 in the year 2015 followed by 0.59 in year 2012. In total span the DC is found in between 0.50-0.80 and the overall value of DC was 0.64 during the study span.

Table 6: Degree of Collaboration

Year	Ns*	Nm*	Total (Ns+Nm)	DC
2011	14	22	36	0.61
2012	11	16	27	0.59
2013	12	25	37	0.67
2014	12	22	34	0.64
2015	18	20	38	0.52
2016	7	24	31	0.77
2017	8	20	28	0.71
Total	82	149	231	0.64

Ns*- Single Author Papers Nm*- Multi Authored Papers DC- Degree of Collaboration

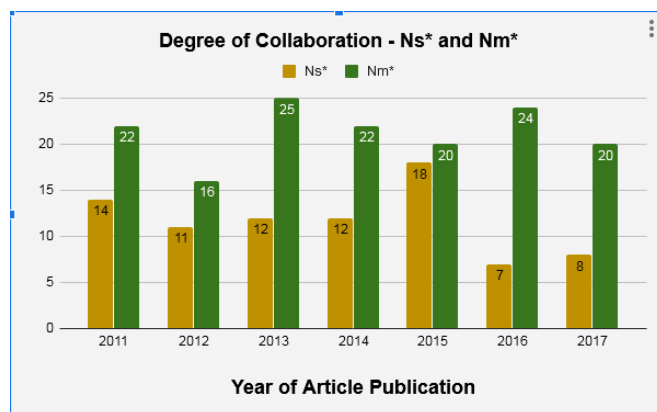


Figure 6: Yearwise Single & Multi Author Papers

5.7 Collaborative Index of Articles

Collaborative Index of articles is a mean number of authors per joint paper. For this analysis, the authors omitted the single authored papers which are equal to 1 always. To determine the mean number of authors per jointly authored paper, the following formula has been used

$$CI = \frac{\text{Total Number of Author}}{\text{Total Joint Papers}}$$

From Table 7 it can be observed that there were maximum CI i.e. 2.50 in the year 2011 and minimum CI i.e. 2.20 in year 2015. There was 2.37 average collaborative index during the stipulated study span of 2011-2017.

Table 7: Collaborative Index of Articles

Year	Multi Authored Papers	Total Authors of Multi Authored Papers	Collaborative Index (CI)
2011	22	55	2.50
2012	16	38	2.37
2013	25	62	2.48
2014	22	50	2.27
2015	20	44	2.20
2016	24	59	2.45
2017	20	46	2.30
Total	149	354	2.37

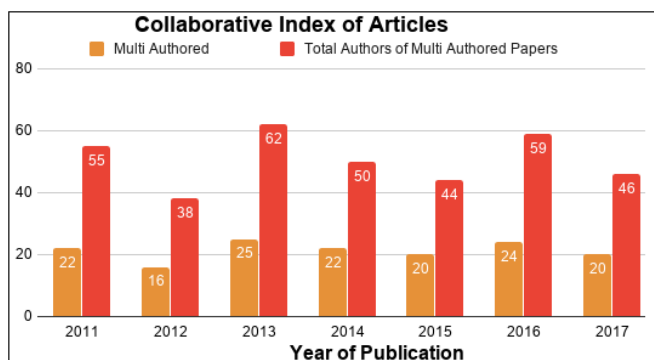


Figure 7: Collaborative Index of Articles

5.8 Cited Reference Distribution Pattern

Table 8 shows that the year wise number of references cited by authors in their articles. There were 231 article with total 4646 reference used during the study period. The maximum number of 836 citation with 22.49 per cent average no. of reference per article sharing was found in the year 2013, and the minimum number of 445 citations with 16.48 per cent reference citation was determined in the year 2012.

Table 8: Year wise Cited Reference Distribution Pattern

Year	Vol.	No. of Papers	Total No. of References	Avg. no. of Ref. Per Articles %	% age
2011	58	36	819	22.75	17.63
2012	59	27	445	16.48	09.58
2013	60	37	836	22.49	17.99
2014	61	34	785	23.09	16.90
2015	62	38	598	15.73	12.87
2016	63	31	569	18.35	12.25
2017	64	28	594	21.21	12.78
Total		231	4646	20.01	100%

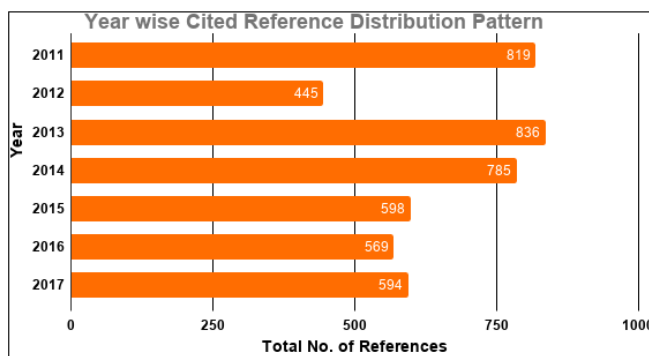


Figure 8: Yearwise Cited Reference Distribution

5.9 Year wise References Citations

Table 9 shows that the number of references cited by the authors in their papers. For the 231 articles, a total of 95 articles (41.13%) have 11-20 references followed by 49 (21.21%) with 1-10 references, 42 articles (18.18 %) have 21-30 references, 34 articles (14.72%) with 31-40 references and 11 articles (4.76%) with more than 41 references. Majority of the articles were prepared by referring 11-20 references.

Table 9: Year wise References Citations

Year wise cited References	1-10	11-20	21-30	31-40	>40	Total
2011	4	19	6	4	3	36
2012	8	12	4	3	-	27
2013	6	11	8	12	-	37
2014	8	12	6	5	3	34
2015	8	17	11	1	1	38
2016	10	11	5	3	2	31
2017	5	13	2	6	2	28
Total	49	95	42	34	11	231
%	21.21	41.13	18.18	14.72	4.76	100

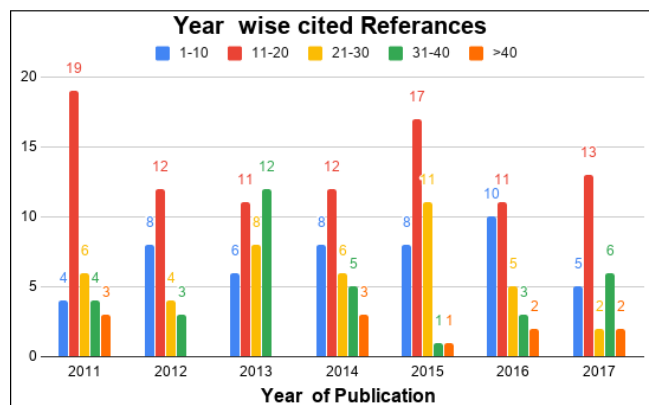


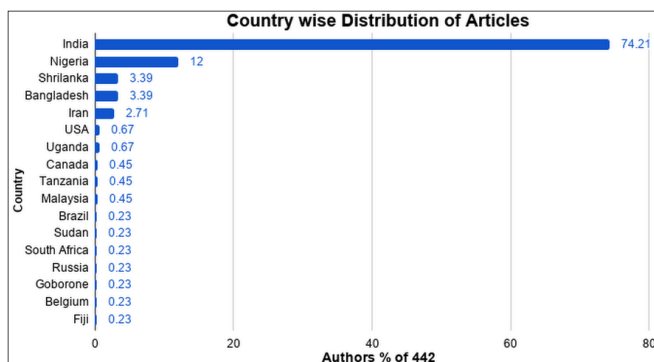
Figure 9: Year wise References Citations

5.10 Country wise Geographical Distribution of Articles

Table 10 provides percentage of country wise geographical distribution of articles of 442 contributors from 17 different countries. Out of 328 (74.21%) articles were contributed by India, followed by 53 (12%) from Nigeria and 15 (3.39%) of contributions came from the countries Shrilanka and Bangladesh both which are at the third place, it is clear that near about 75% contributors from india, in the study conducted by the Shivakumaraswamy and Muthuraj [10] states that the same result in their study.

Table 10: Country wise Distribution of Articles

Sr. No.	Country	No. of Authors	% of 442	Rank
1	India	328	74.21	1
2	Nigeria	53	12.00	2
3	Shrilanka	15	3.39	3
4	Bangladesh	15	3.39	3
5	Iran	12	2.71	4
6	USA	3	0.67	5
7	Uganda	3	0.67	5
8	Canada	2	0.45	6
9	Tanzania	2	0.45	6
10	Malaysia	2	0.45	6
11	Brazil	1	0.23	7
12	Sudan	1	0.23	7
13	South Africa	1	0.23	7
14	Russia	1	0.23	7
15	Goborone	1	0.23	7
16	Belgium	1	0.23	7
17	Fiji	1	0.23	7
		442	100.00	

**Figure 10:** Country wise Distribution of Articles

5.11 State wise Distribution of Articles

Table 11 shows that percentage of state wise distribution of 187 contributors from top ten states. Out of 56 (29.95%) articles were contribution from state Delhi, followed by 22 (11.76%) from West Bengal and 18 (9.63%) of contributions came from the Maharashtra State.

Table 11: State wise Distribution of Articles (Top 10 State)

S. No.	State Name	Authors	Percentage	% of 187	Rank
1	Delhi	56	34.14	29.95	1
2	West Bengal	22	13.41	11.76	2
3	Maharashtra	18	10.97	9.63	3
4	Karnataka	16	9.76	8.56	4
5	Kerala	15	9.15	8.02	5
6	Jammu & Kashmir	10	6.10	5.35	6
7	Punjab	9	5.49	4.81	7
8	Tamil nadu	9	5.49	4.81	7
9	Orissa	5	3.05	2.67	8
10	Uttar Pradesh	4	2.44	2.14	9
	Total	164/187	100.00	87.70	

5.12 City wise Distribution of Articles

Table 12 shows that percentage of city wise distribution of 251 contributors from top ten cities. Out of 63 (25.10%) articles were contribution from city New Delhi, followed by

18 (7.17%) from Mumbai followed by 15 (5.98%) from Kolkata State.

Table 12: City wise Distribution of Articles (Top 10 Citys)

Sr. No.	City Name	Authors	Percentage	% of 251	Rank
1	New Delhi	63	39.62	25.10	1
2	Mumbai	18	11.32	7.17	2
3	Kolkata	15	9.43	5.98	3
4	Tiruvanthapuram	15	9.43	5.98	3
5	Mysore	14	8.81	5.58	4
6	Bangalore	10	6.29	3.98	5
7	Varanasi	7	4.40	2.79	6
8	Midnapore	6	3.77	2.39	7
9	Chandigarh	6	3.77	2.39	7
10	Pune	5	3.14	1.99	8
		159/251	100.00	63.35	

6. Conclusion

During the 2011-2017 period of publication of journal Annals of Library and information studies 231 research articles was published i. e. from its volume 58 to volume 64. A maximum number of 38 articles were published in the year 2015 with 16.45% sharing. Out of 231 articles 82 (35.50%) articles were contributed by the single authors. The maximum AAPP 2.12 with minimum productivity per author 0.46 in the year 2016. The highest value of DC and CI has been calculated in 2016, and 2011 respectively. Overall 17 countries contributors were noticed in the 2011-2017 study period and India got a first rank with 328 contributions with 74.21% sharing. Nigeria and Shrilanka got the second and third rank respectively. In this study, it is observed that the authors used 4646 references in the 231 articles and its overall average citations per paper were 20.01. From this it is clear that Indian LIS researcher's contribution is very high as compared to other contributors.

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