

2018

Journal of Information Science: A Bibliometric Analysis

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Gurikar, Rushmanasab; Hadagali, Gururaj S. Assistant Professor; and Mulimani, Renuka S. Senior Research Fellow, "Journal of Information Science: A Bibliometric Analysis" (2018). *Library Philosophy and Practice (e-journal)*. 1974.
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Journal of Information Science: A Bibliometric Analysis

Abstract: The present study analyses the Journal of Information Science for the time frame 2005 to 2014. The data for the study was retrieved from the official website of the journal. The analysis of the publications was done using various parameters such as authorship pattern, Degree of Collaboration, Collaborative index, Collaborative Coefficient, Country wise share of total publications. The findings of the study include the highest number of contributions to the journal were from UK (16.35%) followed by USA (13.57%). The values of Collaborative Coefficient (CC), Collaborative Index and Degree of Collaboration (DC) indicated that the authorship trend is shifting towards multi authorship.

Keywords: Journal of Information Science, Bibliometrics,

INTRODUCTION

Journals are the most popular and widely used source to communicate the research output by the scholarly community. Mabe's (2003) study reveals that 95% of the research work is communicated through journals. The journals have started publishing way back in 1665 and have crossed the mark of 350 years on 2015 (Moxham, 2015). Due to the Research and Development, advancements in technology as well as improvements in publishing industry, the scholarly publishing has gone through many changes and the numbers of journals are also increasing year by year (Mabe and Amin, 2001). The peer review process has enhanced the credibility of the scholarly journals. There are many metric studies which can be utilised to evaluate the quality of research output such as Bibliometrics, Scientometrics, Informetrics and others and Journals are one of the best sources of information in this regard.

Bibliometrics is one of the metric studies which is widely used to evaluate the performance of scientists, journals and institutions (Joshi, 2014). The performance indicators such as Impact Factor, h-index, p-index, g-index, Collaborative Index, International Collaborative Index, Relative Growth Rate & Doubling Time of publications are used to evaluate the publications. Initially, Garfield (1972) proposed citation analysis for evaluating the journals. Later, ISI developed the indicators such as Impact Factor, Cited half life and Immediacy Index for evaluating the journals (Garfield and Sher, 1963). However, the introductions of Scopus, Google Scholar and Scimago Journal Ranking (SJR) have added more indicators for evaluating the journals (Legdesdorff, 2009). Rosas et al. (2011) used the advanced techniques beyond the traditional bibliometrics indicators to evaluate the impact of scholarly literature. The bibliometric studies help users and policy makers to identify the quality of information and serves as an instrument for selection of core journals. The Journal of Information Science is considered as one of the notable scholarly journals in the field of Library and Information Science since its inception. Such studies will help the researchers to understand the nature and characteristics of the journal(s).

THE JOURNAL OF INFORMATION SCIENCE

The Journal of Information Science (JIS) (eISSN: 1741-6485, ISSN: 0165-5515) is an internationally reputed, peer reviewed scholarly journal in the field of Library and Information Science and Computer Science. The journal is published by the Chartered Institute of Library and Information Professionals (CILIP) in association with the Sage publishers. The *Journal of Information Science* was started in 1979 by the Institute of Information Scientists (IIS). The journal was owned by CILIP in 2002 by the merger of IIS and Library Association (LA). The journal was preceded by *Bulletin of the Institute of Information Scientists*, until 1967 and *Information Scientist* until 1979 (ISSN 0020-0263) (Gilchrist, 2008). The journal was edited by Alan Gilchrist until 2004 and the current Editor

in Chief is Adrian Dale and the other editors are primarily from UK, USA and other European countries. The frequency of the journal publication is Bi-monthly. The impact factor of the journal for the year 2016 is 1.372 as assigned by the Journal of Citation Report (JCR). The journal primarily aims on the economic impact, policy formulation, legal and political issues of information and knowledge. It also publishes the literature in the areas of search and retrieval technique, information processing and architecture, content management, information seeking behaviour and information and knowledge management. The journal is indexed in more than 20 indexing and abstracting tools including Current Contents, SCOPUS, LISA, LISTA and Social Science Citation Index.

LITERATURE REVIEW

Many research works have been published on the bibliometric analysis in different areas of Science (Narin, 1976; Borgman, 1990; Hood and Wilson, 2001; Glanzel, 2003; Weingart, 2005; Feeley, 2008) and in Library Science (Nebelong-Bonnevie and Faber Frandsen, 2006; Mukherjee, 2009; Serenko, *et al.*, 2010; Tsay and Shu, 2011). Some of the studies are focused on Journal of Information Science (Bonnevie, 2003; Devalingam and Sebastiyam, 2009; Tsay, 2011). Bonnevie (2003) analyses the *Journal of Information Science* emphasising on the publication pattern, citation analysis, impact factor, visibility, authorship pattern, scientific impact, collaboration etc. Kumar and Moorthy (2011) carried out a bibliometric study on the *DESIDOC Journal of Library and Information Science* for the period 2001-2010. The authors analyse the journal based on various indicators such as growth rate, content coverage and authorship pattern. The study unveils that the major portion of the papers were from the single authors. Tsay (2103) in his study reveals that the information retrieval, subject indexing, WWW, technical services, citation analysis and information seeking behaviour are the main knowledge input subject areas in LIS mainly in *Journal of the*

American Society for Information Science and Technology, Journal of Information Science, Information Processing and Management and Journal of Documentation.

Nebelong-Bonnevie and Frandsen (2006) analyse the *Journal of Documentation* and found to be the highly visible journal in LIS field. Further, it is observed from the study that the journal relatively published lesser number of documents. However, the journal's visibility seemed to be more among the scholarly community in the LIS field. The study conducted by Mukherjee (2009) shows the bibliometric characteristics of the *Journal of the American Society for Information Science and Technology*. Barik and Jena (2013) conducted a bibliometric analysis of the *Journal of Knowledge Management Practice*. It reveals that the single author (42.7%) contribution was predominant during the study period. The USA (18.80%) shared the highest number of articles to the journal. Singh (2013) explores the journal *Collection Building* during 2005-2012 through citation analysis and finds that articles are the most cited sources and majority of the articles (69.92%) are contributed by the single authors. Tsay and Shu (2011) explore the bibliometric characteristics of the *Journal of Documentation* and found that journal articles were the most cited documents. Verma et al. (2007) analyse the publications of the journal *Annals of Library and Information Studies* for the period 1999-2005. The study found that most of the contributions to the journal were from single authors.

OBJECTIVES OF THE STUDY

The major objectives of the study are to:

- study the year wise distribution of publications;
- identify the different forms of publications;
- examine the author collaboration pattern;
- study the collaboration with the foreign counterparts.

METHODS AND MATERIALS

For the present study, data was extracted directly from the journals' website. The published items included articles, editorials, corrigendum, erratum, retracted, obituaries, indexes. Publications were downloaded from volume 31 (2005) to volume 40 (2014). A total of 530 items were downloaded from the journal website. However, the study considers only research articles for the analysis. The Microsoft Excel was used for data tabulation under certain headings – title, no. of authors, name of county, no. of key words pages and reference etc. There are many instances where an author belonged to two or more nations; in that case the first affiliated country was taken into consideration. In case of corresponding authors, the same was added in the corresponding country.

ANALYSIS AND INTERPRETATION

Table 1 : Forms of publications

Type of Items	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	%
Articles	44	43	48	56	47	50	51	41	60	64	504	95.09
Editorials	6	3	0	1	0	1	0	0	1	0	12	2.26
Book Review	0	0	0	0	0	0	0	0	0	1	1	0.19
Corrigendum	0	0	0	0	0	0	0	2	1	0	3	0.57
Erratum	0	0	1	0	2	0	1	0	0	0	4	0.75
Retracted	0	0	0	1	0	0	0	0	0	0	1	0.19
Obituary	0	0	1	0	0	0	0	0	0	0	1	0.19
Index	1	1	0	0	0	0	0	0	0	0	2	0.38
About Contributors	0	0	0	1	0	0	0	0	0	0	1	0.19
Response Letters	0	0	0	0	0	0	0	0	0	1	1	0.19
Total	51	47	50	59	49	51	52	43	62	66	n=530	100

The table 1 depicts the forms of publications published during the period from 2005 to 2014. A total of 530 numbers of items were published in a span of ten years with six issues per year. It is observed from the table that 504 (95.09%) articles were published during the period of ten years, which constitute the highest percentage. Whereas, 12 (02.26%) editorial items and 04 (07.75%) erratum were also notable items published during the same period.

The table 1 provides the other details of different forms of publications. The annual average number of items published in ten years duration was 53. The highest numbers of items published were 62 and 66 items in the year 2013 and 2014 respectively. It was observed from the table 1 that there was an increase of published items from 51 in 2005 to 66 in 2014. It is observed from the study that the number of issues remained the same during the study period. However, there is an average increase of 01.50 items during the period.

Table 2: Volume wise distribution of publications

Year	Vol./ Issue	Feb.	Apr.	Jun.	Aug.	Oct.	Dec.	Total	%
2005	31	8	7	7	6	8	8	44	8.73
2006	32	7	8	6	9	7	6	43	8.53
2007	33	6	9	9	8	8	8	48	9.52
2008	34	7	7	8	17	9	8	56	11.11
2009	35	8	9	6	8	8	8	47	9.33
2010	36	8	9	8	7	7	11	50	9.92
2011	37	8	9	10	9	8	7	51	10.12
2012	38	7	7	7	6	6	8	41	8.13
2013	39	12	9	10	10	9	10	60	11.9
2014	40	11	10	11	10	10	12	64	12.7
Total	10	82	84	82	90	80	86	n=504	100
%	-	16.27	16.67	16.27	17.86	15.87	17.06	100	

It is evident from the data that out of 530 items published, 504 (95.09%) are research articles. The table 2 reveals the scattering of literature in the Journal of Information Science from 2005 to 2014. The average research articles published in ten years duration was 50.40. The highest i.e. 64 (12.70%) articles published during 2014, followed by, 60 (11.90%) articles were published during 2013. The lowest i.e. 41 (8.13%) articles during 2012; 43 (8.53%) articles in the year 2006; 44 (8.73%) in 2005 were published respectively. It is also observed from the table that almost equal numbers of articles were published during the period except for 2013 and 2014 respectively. It is observed from the table that the journal exhibited gradual increase in research articles during the period. However, there is no significant difference between the no. of articles published in all the issues.

Table 3: Authorship Pattern & Year wise distribution of Published Articles

Number of Articles Published during 2005 - 2014													
Authorship	Year										Total	Percentage	Total Authors
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014			
Single Author	16	5	10	26	09	08	11	05	14	09	113	22.42	113
Two Authors	21	17	16	16	20	20	18	17	17	28	190	37.70	380
Three Authors	02	14	15	09	14	17	17	12	15	15	130	25.79	390
Four Authors	02	05	04	03	02	05	03	04	08	08	44	8.73	176
Five Authors	02	01	02	01	01	00	01	01	03	03	15	2.98	75
Six Authors	01	00	00	01	00	00	00	02	01	01	06	1.19	36
Seven Authors	00	01	00	00	01	00	01	00	02	00	05	0.99	35
Ten Authors	00	00	01	00	00	00	00	00	00	00	01	0.20	10
Total Articles	44	43	48	56	47	50	51	41	60	64	504	100.00	
Total Authors	88	113	123	108	111	119	122	108	160	163	1215		1215
Average Authorship	2.00	2.63	2.56	1.93	2.36	2.38	2.39	2.63	2.67	2.55	2.41 (CI)		
Single Authorship %	36.36	11.63	20.83	46.43	19.15	16.00	21.57	12.20	23.33	14.06	22.42		
Collaboration Authorship %	63.64	88.37	79.17	53.57	80.85	84.00	78.43	87.80	76.67	85.94	77.58		
CC	0.36	0.55	0.49	0.32	0.48	0.51	0.48	0.54	0.5	0.52	0.48		

Authorship pattern is one of the important aspects in bibliometric studies. The table 3 reveals the year wise authorship pattern of publications during the period from 2005 to 2014. The proportion of single authorship is 22.42% and 77.58% respectively. The lowest numbers of single authored papers were published (11.63%) in the year 2006 and the highest numbers of collaborative authored papers were published (88.37%) in the same year. On the contrary, the highest number of single authored papers were published (46.43%) in the year 2008 and the lowest collaborative authored papers were (53.57%) in the same year. The two authored articles constituted the highest (190, 37.70%) publication share, followed by, 130 (25.79%) articles were authored by three authors, 113 (22.42%) articles were authored by single authors. It is clear from the data that the collaborative articles are gaining prominence in the journal. The highest number of (26) single authored articles were published in 2008 and the highest (28) two authored articles were published in 2014. The data shows that multiple authored articles are found to be increasing from 2005 to 2014. The average authorship per article was 2.41 during the period from 2005 to 2014. The lowest (1.93) average authorship was in 2008 and the highest (2.67) in 2013. A total of 504 articles were contributed by 1215 authors. However, the actual authors were less because many authors have contributed in more than one article. The lowest (88) number of authors contributed in 2005 and the highest (163) contribution was in 2014.

The table 3 reveals the collaborative measures i.e. Collaborative Index (CI) and Collaborative Coefficient (CC). The Collaborative Index measures the mean number of authors per paper. The Collaborative Index value was found to be 2.41. The value of Collaborative Coefficient was increased from 0.36 in the year 2005 to 0.52 for the year 2014. Both the CI and CC values indicate that the publication trend is shifting towards multi-authorship.

Table 4: Degree of Collaboration (DC)

Authorship Pattern	Number of Publication	% of Total Publication	Degree of Collaboration (DC)
Total Number of Single/Multi authored Publications	504	100	
Number of Co-authored Publications	391	77.58	0.77
Number of Single authored Publications	113	22.42	
Number of Two authored Publications	190	37.69	0.62
Number of Three authored Publications	130	25.79	0.53
Number of Four authored Publications	44	8.73	0.28
Number of Five authored Publications	15	2.97	0.11
Number of Six authored Publications	6	1.19	0.05
Number of Seven authored Publications	5	0.99	0.04
Number of more than seven authored Publications	1	0.19	0.008

The table 4 depicts the Degree of Collaboration (DC). The Degree of Collaboration was measured using the formula suggested by Subramanyan (1983).

$$DC = \frac{NM}{Nm + Ns}$$

Where,

DC= Degree of Collaboration

NM= Number of Multi Authored Contributions

Ns= Number of Single Authored Contributions

In the present study, the value of DC is

$$=0.77 \text{ (DC=391/391+113)}$$

It is observed from the table 4 that the trend is towards multi authorship. The DC is the highest (0.62) for two authored publications, followed by, three authored (0.53) publications.

Table 5: Country wise Authorship Collaboration

Rank	Country	Number of Articles						Total	
		Individual Contribution		Collaboration within the Country		Collaboration with foreign Authors			
1	UK	28	24.78%	44	13.54%	22	16.06%	94	16.35%
2	USA	21	18.58%	41	12.62%	16	11.68%	78	13.57%
3	China	6	5.31%	32	09.85%	13	9.49%	51	8.87%
4	Taiwan	10	8.85%	37	11.38%	3	2.19%	50	8.70%
5	South Korea	2	1.77%	35	10.77%	2	1.46%	39	6.78%
6	Spain	4	3.54%	23	7.08%	8	5.84%	35	6.09%
7	Canada	1	0.88%	9	2.77%	6	4.38%	16	2.78%
8	Singapore	0	0.00%	12	3.69%	3	2.19%	15	2.61%
9	Finland	6	5.31%	7	2.15%	1	0.73%	14	2.43%
9	Iran	2	1.77%	7	2.15%	5	3.65%	14	2.43%
9	Jordan	1	0.88%	10	3.08%	3	2.19%	14	2.43%
9	Netherlands	2	1.77%	4	1.23%	8	5.84%	14	2.43%
10	Australia	4	3.54%	5	1.54%	1	0.73%	10	1.74%
10	Greece	2	1.77%	6	1.85%	2	1.46%	10	1.74%
11	Germany	1	0.88%	3	0.92%	5	3.65%	9	1.57%
11	Ireland	1	0.88%	5	1.54%	3	2.19%	9	1.57%
11	Israel	2	1.77%	7	2.15%	0	0.00%	9	1.57%
12	France	1	0.88%	3	0.92%	4	2.92%	8	1.39%
13	Belgium	1	0.88%	1	0.31%	5	3.65%	7	1.22%
13	India	0	0.00%	6	1.85%	1	0.73%	7	1.22%
14	Turkey	2	1.77%	4	1.23%	0	0.00%	6	1.04%
15	Hong Kong	0	0.00%	2	0.62%	3	2.19%	5	0.87%
15	Japan	2	1.77%	3	0.92%	0	0.00%	5	0.87%
16	Hungary	4	3.54%	0	0.00%	0	0.00%	4	0.70%
16	Italy	0	0.00%	2	0.62%	2	1.46%	4	0.70%
16	Nigeria	3	2.65%	1	0.31%	0	0.00%	4	0.70%
16	Poland	1	0.88%	0	0.00%	3	2.19%	4	0.70%
17	Austria	0	0.00%	3	0.92%	0	0.00%	3	0.52%
17	Denmark	2	1.77%	0	0.00%	1	0.73%	3	0.52%
17	Malaysia	0	0.00%	1	0.31%	2	1.46%	3	0.52%
18	Brazil	1	0.88%	1	0.31%	0	0.00%	2	0.35%
18	Mexico	0	0.00%	0	0.00%	2	1.46%	2	0.35%
18	Qatar	0	0.00%	0	0.00%	2	1.46%	2	0.35%
18	Saudi Arabia	1	0.88%	1	0.31%	0	0.00%	2	0.35%
18	South Africa	0	0.00%	2	0.62%	0	0.00%	2	0.35%
18	Sweden	1	0.88%	1	0.31%	0	0.00%	2	0.35%
18	Switzerland	0	0.00%	0	0.00%	2	1.46%	2	0.35%
19	Azerbaijan	0	0.00%	1	0.31%	0	0.00%	1	0.17%

19	Ecuador	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Estonia	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Lithuania	0	0.00%	1	0.31%	0	0.00%	1	0.17%
19	Mauritius	1	0.88%	0	0.00%	0	0.00%	1	0.17%
19	Myanmar	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Norway	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Oman	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Pakistan	0	0.00%	1	0.31%	0	0.00%	1	0.17%
19	Portugal	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Scotland	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Serbia	0	0.00%	0	0.00%	1	0.73%	1	0.17%
19	Slovenia	0	0.00%	1	0.31%	0	0.00%	1	0.17%
19	Thailand	0	0.00%	1	0.31%	0	0.00%	1	0.17%
19	Tunisia	0	0.00%	1	0.31%	0	0.00%	1	0.17%
19	UAE	0	0.00%	1	0.31%	0	0.00%	1	0.17%
19	Wales	0	0.00%	0	0.00%	1	0.73%	1	0.17%
Total		113	100%	325	100%	137	100%	575#	100%

The number differs because of multi-authored articles contributed from more than 2 countries

The table 5 shows the contributions of scholarly articles belonging 54 countries for the journal during the period from 2005 to 2014. However, the total number of country names (575) was greater than the total number of scholarly articles (504) in the journal, because the multi-authored articles were contributed as result of collaboration effort. The top ten country authors' contribution constituted 70.60% of the total output.

The highest numbers of articles (230) were contributed by the European authors from 24 countries. The United Kingdom (94) and Spain (35) are the major contributors from the European countries. The UK topped the list with 16.35% of the total articles. The performance of the Asian countries was quite significant, because, the Asian country authors' contribution (228) was higher than those of the North American country authors' (96). Asian country authors' contribution was 39.65% as compared to North American country authors with 16.69%. However, only 3 country authors contributed from North America, whereas, 20 country authors contributed from Asia. China (51), Taiwan (50) and South Korea (39) were the major contributors from Asia. On the other hand, the USA (78) and Canada (16) were the

major contributors from North America. The Australian authors shared 10 articles. The authors from Africa contributed 08 articles from 04 countries and South American country authors added 03 articles from 02 countries.

The non-UK or non-European country authors' contribution was significant during the study period. The UK (28) and the USA (21) contributed the major share of solo authored articles than any other countries. Although there are 03 countries from Asia in the table top five countries but solo authored articles were insignificant as compared to the UK and the USA. The UK (44), the USA (41), Taiwan (37) and South Korea (35) were the top performers in terms of collaboration within the country. On the other hand, the UK (22), the USA (16) China (13), Spain (08) and Netherlands' (08) authors are the major collaborators with foreign authors.

DISCUSSIONS AND CONCLUSION

The Journal of Information Science is one of the important publications in the field of LIS. The study aims to understand the publication culture and collaborative tendencies of the journal. The contributions included ten different forms of publications. However, the large numbers of them were research articles which constituted 95.09% of the total publications. The highest number of contributions were from UK constituting 16.35% of the total publications, followed by, the USA (13.57%). It is due to the reason that the journal is published by Chartered Institute of Library of Information Professionals (CILIP) UK in association with the Sage publishing, USA. The two authored publications constituted the highest percentage (37.70%) of the total publications, followed by, the three authored publications (25.79%). The measured values of Collaborative Coefficient, Degree of Collaboration and Collaborative Index indicated that the publication trend is shifting towards multiple authorship.

The bibliometric analysis of journals will help the scientific community to know the core journals in a particular field and these kinds of studies will help them to make a right choice among the various journals in which they have to publish their publications. The list of core journals will help the libraries offering services to the specialised users in subscription of the best quality journals and to provide the best service to their library users.

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