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## Contributions of Open Access Journals in Library and Information Science indexed in SCOPUS Database: A Metric Study

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## Contributions of Open Access Journals in Library and Information Science indexed in SCOPUS Database: A Metric Study

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### Abstract

**Purpose.** The primary purpose of this paper is to measure the present status of publications, authors, citations, authors per publication, citations per publication, country, journal rank, Source-Normalized Impact per Paper (SNIP), Cite Score, h-index, authorship productivity, and collaborative nature of open-access (OA) library and information science (LIS) journals in the SCOPUS database.

**Material and Methods.** The study selected 61 open access journals of LIS in the SCOPUS database as a sample and assessed their current status. SCOPUS database was used to extract the bibliographical and citation data, and SCImago was used to extract the Country, Source-Normalized Impact per Paper (SNIP), and Cite Score.

**Results.** A total number of 31 countries were contributed to 20250 publications by 40628 authors, which got 109050 citations from 1946 to 2020. The study found that the United States (US) has contributed the highest number of OA journals (10, 16.39%), 7982 publications by 15776 authors with an average of 1.98 authors per publication which got 54157 citations with an average of 6.78 citations per publication and followed by United Kingdom (UK) which has contributed a good number of (1848) publications by 5188 collaborative authors, resulting from an average of 2.81 authors per publication and which got 27320 citations, with an average of 14.78 citations per publication. The US has the highest number of citations (37658) in the period 2011-2015 and the lowest number of citations (99) in the period (1946-1973). The study has clearly shown that the h-index of the US (73) and UK (66) topped the other 29 countries, and also the US has received the highest SNIP (11.147), and the UK has received the highest cite score (26.8, 39.70%).

**Conclusion.** This study will be useful for library and information science students, researchers and professionals to know about the quality of OA journals and their impacts and visibility of the LIS publications in SCOPUS database.

**Keywords:** OA, Open Access, LIS, Library and Information Science, SCOPUS

## **1. Introduction**

The concept of open access (OA) that opened new dimensions in the information communication cycle has been widely accepted worldwide. Open access, which provides free access to the information content, is widely expanding its domain because of the enormous benefits. It is a blessing for everyone involved with the information communication process. Their growth and development have been one of the success stories over the World Wide Web. With only five journals offering open access mode to their contents in 1992 and 1200 in 2004 (Falk, 2004),

Different authorities on open access have highlighted this budding concept in different ways. One of the lucid definitions of open access has been provided by Budapest open access initiative which states that open access is the free availability of articles on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself (Budapest Open Access Initiative, 2002).

### **1.1. SCOPUS**

Scopus is the largest abstract and citation database of peer-reviewed literature and quality web source with smart tools to track, analyze and visualize research. It has designed to find the information that scientists need. Quick, easy, and comprehensive, Scopus provides superior support of the literature research process (Falagas et al., 2008; Bakkalbasi, Bauer, Glover, Wang, 2008; Burnham, 2006).

### **1.2. SCImago**

The SCImago Journal & Country Rank (SCImago) is a portal that includes the journals and country scientific indicators developed from the information contained in the Scopus® database (Elsevier B.V.). These indicators can be used to assess and analyze scientific domains. This platform got its name from the SCImago Journal Rank (SJR) indicator, developed by SCImago from the widely known algorithm Google PageRank™ (Falagas, 2008).

## **2. Review of Literature**

Several studies have been carried that highlight various facets of open access. Falk (2004) studied that 1200 open access journals were available on the Web as compared to a total of only five OA journals in 1992. Spiroski (2010) studied to present the country rank, journal rank, and h-index in the field of medicine in the Republic of Macedonia and other former Yugoslav countries (Slovenia, Croatia, Serbia, Bosnia, and Herzegovina, and Montenegro) using data from SCImago Journal & Country Rank from 1996 to 2008. Rufai, R., Gul, & Shah (2012) revealed an expounding growth of open access titles in the field of LIS. Commercial publishers have also

joined hands as open access market players. Indexing policies of OA titles in LIS need to be restructured, and low-income nations have to evolve in the field of OA bazaar. Jena, K. L. (2006) analyzed the journal "Indian Journal of Fibre and Textile Research" for the period 1996 – 2004 which have studied the trend of publications such as the year-wise distribution of articles, bibliographical distribution of citations, authorship pattern, citation pattern, the average length of articles, number of tables and figures used, time lag, geographical distribution of authors, and subject analysis. Khallaf (2017) studied about 12 Arabic open access journals' web pages during May and June 2019 in 8 Arab countries. Van Leeuwen, & Wouters (2017) analyzed the research on Journal Impact Factors (JIFs) and analyzed in the field of quantitative science studies related to the most famous and classic bibliometric indicator around and to see what characteristics apply to the research on JIFs. Kumar (2018) investigated the growth of LIS journals included in the Directory of Open Access Journals and focused on 129 open access journals of library and information science. The study used parameters like year-wise, country-wise, and language-wise for the data analysis. Chen, & Du (2016) indicated that the production capability, academic influence, and network communication ability are essential factors affecting OA journals' quality. These three evaluation indicators of LIS OA journals are high, but many still have room for improvement. Acharya (2018) analysed the status of 497 OAJs in Agriculture indexed in Directory of Open Access Journals. Specified traits such as Geographic and language wise distribution, coverage of Indexing/Abstracting databases, ranking of journals according to Impact Factor (IF), OA licensing model adopted, policy of plagiarism, visibility on social media and related issues of the OAJs in Agriculture. Nazim & Ahmadi (2018) examined the growth and development of Open Access (OA) initiatives in India. The study is based on a brief survey of literature and data collected from Web of Science™-Core Collection, Directory of Open Access Journals (DOAJ), Directory of Open Access Repositories (OpenDOAR). It is also looks at India's position in the global Open Access in terms of its ranking with regards to the total OA Journals, total research output, OA gold papers. It is also found that in spite of its relatively lower position in OA gold papers, India's position in terms of share of gold OA publications is relatively higher than other leading countries of the world. Singh & Chander (2018) highlighted the position of LIS open access journals indexed in DOAJ. Directory of Open Access Journals (DOAJ) is an indexing service indexes high quality peer-reviewed journal of Science & technology, Social Sciences and Humanities. About 119 LIS Journals are indexed in DOAJ in the month of September, 2017. Sahoo, Mohanty & Sahoo (2017) provided a comprehensive view of Indian contribution towards open access journal movement, particularly the journals indexed in the Directory of Open Access Journals (DOAJ) - a service from Lund University. It seeks to explore the relative position of India among other countries and provides an analysis of the indexed journals from several parameters. Reza Ghane & Niazmand (2016) studied the status of open access (OA) journals published in Developing 8 (D-8) countries, i.e. Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan and Turkey. The authors' web-based data sources for journal-based metrics were the Directory of Open Access Journals (DOAJ), Thomson Reuters (Journal Citation Reports [JCR], which provided journal impact factors [JIF]) and Scopus

(source normalized impact per paper [SNIP] and SCImago journal rank [SJR]). It is also obtained information about journals published before 2000 to 2014. Aswathy & Gopikuttan (2013) analyzed the contribution of open access literature in the subject physics through DOAJ. It covers literature contribution of a wide variety of subjects, countries and also different languages. It is also analyzed the contributions of institution-wise, language-wise distributions in India. GH, Srinivasa, Reddy & Chandra (2012) evaluated the initiatives taken by India to make this intellectual output accessible for all by publishing them in open access resources like open access journals and repositories. It is resulted that India is continuously contributing in open access literature as some of the premier institutions, particularly in the agriculture sciences. This current study analyses the open access journals of Library and Information Science and measures LIS OA journals' quality by analyzing production capability, academic influence, publication visibility, and network communication ability. Rather than the traditional research methods, this study's focus is on the value of the Web as a source of impact indices. It contributes to the scholarly impact measurements of OA journals. This study will be useful for library and information science to know about the quality of journals and the LIS publications' impact.

### **3. Objectives of the Study**

The following are the primary objectives of the study

- To identify the present status of OA journals in LIS indexed by SCOPUS database.
- To find out the country-wise contribution of publications, authors, citations, and h-index of OA journals.
- To analyze the year-wise growth of publications, and citations
- To know the SNIP, and Cite Score of OA journals in LIS
- To study the country-wise authorship pattern of publications.

### **4. Research Methodology**

The study's data has been extracted from the SCOPUS and SCImago database on the 1st week of January 2021. A total of 299 LIS journals were indexed in the SCOPUS, Out of 299 journals, 61 journals are available in the open access. This study mainly focused on OA journals in the field of LIS. It was found that 61 OA journals were contributed to 20250 publications by 40628 authors, which got 109050 citations. Further, it is analyzed based on the indicators such as publications, authors, citations, authors per publication, citations per publication, country, journal rank, SNIP, Cite Score and h-index of LIS open access journals. SCOPUS database was used to extract the bibliographical and citation data, and SCImago Ranking site was used to extract the Country, SNIP, and Cite Score.

## **5. Data Analysis**

The data extracted from the SCOPUS database and SCImago Ranking Site and the data were converted into Ms-Excel for the purpose of calculations. The data were analyzed using simple percentage and ranking.

### **5.1. Distributions of Journals and Publications by Country-wise**

The study has been analyzed to determine the country-wise distributions of OA journals and their publications in the field of LIS. The details are given in Table 1.

#### **5.1.1 Journals**

It is found that 31 countries were contributed 61 OA journals in LIS from the SCOPUS database. The 61 OA journals have contributed 20250 publications from the period of 1946 to 2020. Further, it is found that the US has contributed the highest number of OA journals (10, 16.39%), followed by the UK has contributed a good number of OA Journals (7, 11.48%) in the SCOPUS database. It is also found that Canada, Iran, Netherlands, Russia, and Taiwan each have contributed (2, 3.28%) OA journals. The remaining 24 countries were contributed only 1 journal in the field of LIS from the SCOPUS database.

#### **5.1.2 Publications**

It is also found that the country-wise contributions of OA publications. It clearly shows that US has contributed the highest number of OA publications (7982, 39.42%) and placed in the first rank, followed by the UK which has contributed a good number of OA publications (1848, 9.13%) and occupied the second rank. Further, it is found that the publications of Brazil (1496, 7.39%), Spain 945 (4.67%), and Sweden (938, 4.63%) have placed in the third, fourth and fifth ranks respectively. It is also noted that Japan has contributed less number of OA publications (23, 0.11%) and placed in the last rank. It is inferred that the first nine ranked countries were contributed more than 500 OA publications and its ranges from 523, 2.58% to 7982, 39.42%, remaining countries were contributed less than 500 publications and its ranges from 23, 0.11% to 487, 2.40%.

**Table 1**

**Distributions of Journals and Publications**

S. No.	Country	Journals		Publications		Rank	S. No.	Country	Journals		Publications		Rank
		Nos.	%	Nos.	%				Nos.	%	Nos.	%	
1	Argentina	1	1.64	153	0.76	21	16	Japan	1	1.64	23	0.11	31
2	Austria	1	1.64	547	2.70	8	17	Lithuania	1	1.64	59	0.29	27
3	Australia	1	1.64	172	0.85	20	18	Mexico	1	1.64	438	2.16	11
4	Brazil	4	6.56	1496	7.39	3	19	Netherlands	2	3.28	797	3.94	6
5	Canada	2	3.28	778	3.84	7	20	Pakistan	1	1.64	59	0.29	28
6	Chile	1	1.64	215	1.06	18	21	Poland	1	1.64	120	0.59	23
7	Colombia	1	1.64	367	1.81	13	22	Portugal	1	1.64	39	0.19	30
8	Croatia	1	1.64	246	1.21	17	23	Russia	2	3.28	106	0.52	25
9	Cuba	1	1.64	292	1.44	16	24	Spain	4	6.56	945	4.67	4
10	Czech	2	3.28	128	0.63	22	25	South Korea	1	1.64	78	0.39	26
11	Estonia	1	1.64	52	0.26	29	26	Sweden	1	1.64	938	4.63	5
12	France	1	1.64	523	2.58	9	27	Switzerland	1	1.64	188	0.93	19
13	India	1	1.64	303	1.50	15	28	Taiwan	2	3.28	325	1.60	14
14	Iran	2	3.28	487	2.40	10	29	Turkey	1	1.64	111	0.55	24
15	Italy	4	6.56	435	2.15	12	30	UK	7	11.48	1848	9.13	2
							31	US	10	16.39	7982	39.42	1
<b>Total</b>									<b>61</b>	<b>100</b>	<b>20250</b>	<b>100</b>	



## **5.2. Distributions of Publications along with Authors and Citations**

The study has also analyzed the publications' distributions and authors and citations of OA journals, and the same is given in Table 2 and Figure 2.

### **5.2.1 Average number of authors per publication**

It is revealed in Table 2 that the UK has contributed the highest 1848 publications by 5315 collaborative authors, resulting from an average of 2.88 authors per publication and ranked first. It is followed by Cuba has contributed a good number of publications (292) by 759 collaborative authors with an average of 2.60 authors per publication and occupied the second rank. Further, it is found that Poland has contributed 120 publications by 275 collaborative authors, resulting from an average of 2.29 authors per publication and placed in the third rank. It is also found that Brazil has 1496 publications by 3308 collaborative authors and Iran has 487 publications by 1078 collaborative authors both are having an average of 2.21 authors per publication and are placed in the fourth and fifth ranks respectively. It has resulted that Lithuania has contributed less number of publications (59) by 64 collaborative authors and Portugal has contributed 39 publications by 42 collaborative authors both are received an average of 1.08 authors per publication and placed in the last rank.

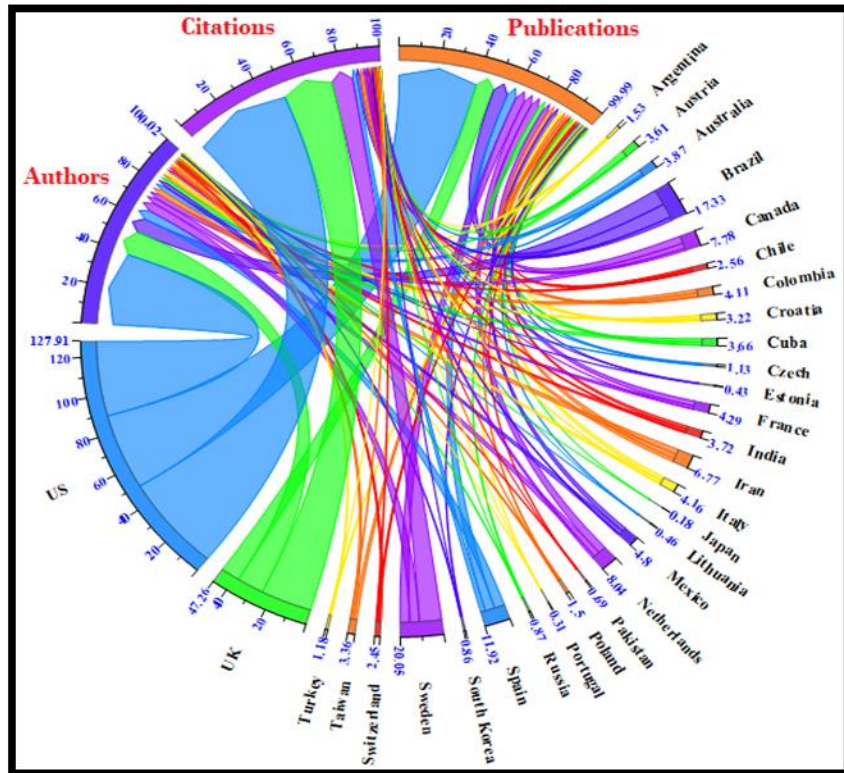
### **5.2.2 Average number of citations per publication**

It shows that 1848 publications contributed by the UK have got 27320 citations in the SCOPUS database with an average of 14.78 citations per publication and ranked first. It is followed by Sweden which contributed 938 publications, which got 11711 citations with an average of 12.49 citations per publication and occupied the second rank. Further, it is found that the US contributed 7982 publications, which got 54157 citations with an average of 6.78 citations per publication and placed in the third rank. It is also found Iran has contributed 487 publications, which got 1881 citations with an average of 3.86 citations per publication, and Australia contributed 547 publications, which got 180 citations with an average of 3.65 citations per publication. It has resulted that the countries of Turkey, Russia, Lithuania, and Japan have contributed less than (1.00%) publications, which got less than(1.00%) citations in the SCOPUS database with an average citation per publication ranges from (0.00 to 0.55).

**Table 2**

**Distributions of Publications along with Authors and Citations**

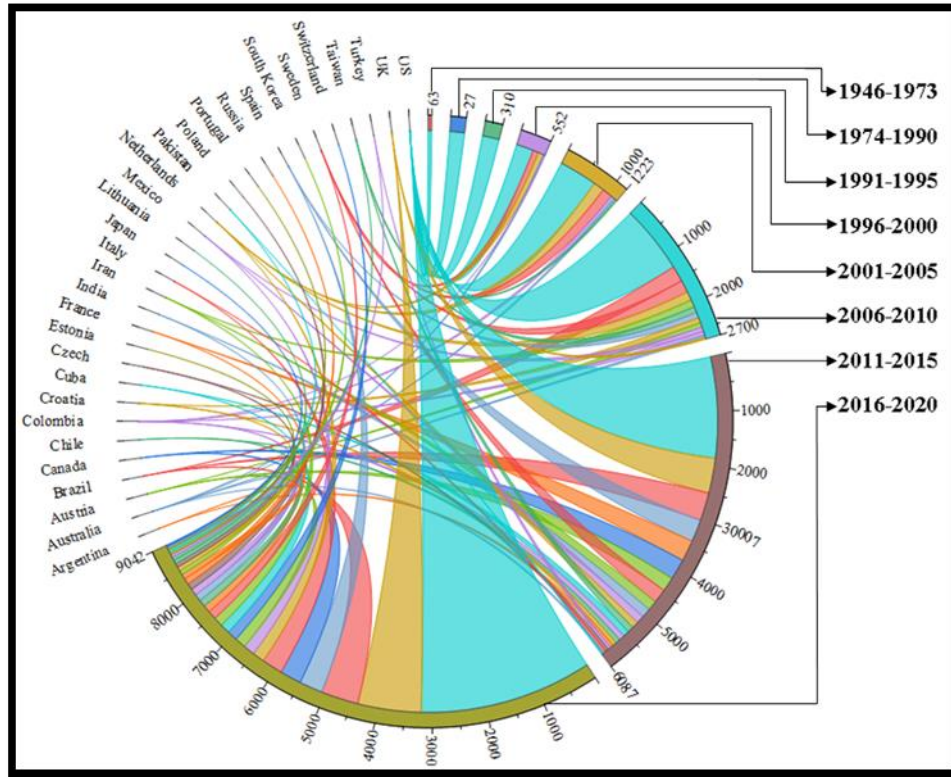
S. No.	Country	Publications		Authors		Citations		APP	CPP	S. No.	Country	Publications		Authors		Citations		APP	CPP
		Nos.	%	Nos.	%	Nos.	%					Nos.	%	Nos.	%	Nos.	%		
1	Argentina	153	0.76	270	0.66	122	0.11	1.76	0.80	16	Japan	23	0.11	27	0.07	0	0.00	1.17	0.00
2	Australia	547	2.70	302	0.74	180	0.17	1.76	0.33	17	Lithuania	59	0.29	64	0.16	10	0.01	1.08	0.17
3	Austria	172	0.85	997	2.45	627	0.57	1.82	3.65	18	Mexico	438	2.16	828	2.04	655	0.60	1.89	1.50
4	Brazil	1496	7.39	3308	8.14	1965	1.80	2.21	1.31	19	Netherlands	797	3.94	1162	2.86	1352	1.24	1.46	1.70
5	Canada	778	3.84	1078	2.65	1403	1.29	1.39	1.80	20	Pakistan	59	0.29	130	0.32	88	0.08	2.20	1.49
6	Chile	215	1.06	427	1.05	489	0.45	1.99	2.27	21	Poland	120	0.59	275	0.68	253	0.23	2.29	2.11
7	Colombia	367	1.81	738	1.82	526	0.48	2.01	1.43	22	Portugal	39	0.19	42	0.10	19	0.02	1.08	0.49
8	Croatia,	246	1.21	514	1.27	802	0.74	2.09	3.26	23	Russia	106	0.52	133	0.33	23	0.02	1.25	0.22
9	Cuba	292	1.44	759	1.87	383	0.35	2.60	1.31	24	Spain	945	4.67	2032	5.00	2453	2.25	2.15	2.60
10	Czech	128	0.63	163	0.40	106	0.10	1.27	0.83	25	South Korea	78	0.39	157	0.39	89	0.08	2.01	1.14
11	Estonia	52	0.26	59	0.15	20	0.02	1.13	0.38	26	Sweden	938	4.63	1900	4.68	11711	10.74	2.03	12.49
12	France	523	2.58	629	1.55	175	0.16	1.20	0.33	27	Switzerland	188	0.93	443	1.09	471	0.43	2.35	2.51
13	India	303	1.50	563	1.39	903	0.83	1.86	2.98	28	Taiwan	325	1.60	559	1.38	416	0.38	1.72	1.28
14	Iran	487	2.40	1078	2.65	1881	1.72	2.21	3.86	29	Turkey	111	0.55	230	0.57	61	0.06	2.07	0.55
15	Italy	435	2.15	672	1.65	390	0.36	1.54	0.90	30	UK	1848	9.13	5315	13.08	27320	25.05	2.88	14.78
										31	US	7982	39.42	15776	38.83	54157	49.66	1.98	6.78
<b>Total</b>												<b>20250</b>	<b>100</b>	<b>40628</b>	<b>100</b>	<b>109050</b>	<b>100</b>		



**Figure 1 Distribution of Publications along with Authors and Citations**

### 5.3. Year-wise distributions of publications

The study has been analyzed the overall growth of publications in OA journals in the field of LIS from the SCOPUS database from 1946 to 2020. The total years are 74, whereas only 40 years have the publications. They were grouped into 8 block years, and the same is given in Table 3 and Figure 2. The countries are shown according to the order of alphabets from 1946 to 2020. The US takes the first position in the contributions of publications (7982), and it is continuously contributing their research for 74 years in LIS field in OA journals from the SCOPUS database during 1946-2020. It is followed by the UK has contributed a good number of (1848) publications in a concise period 2006-2020. Further, it is found that the countries of Australia (172), Colombia (367), Netherlands (797), and Sweden (938) have contributed their publications for 25 years in OA journals during 1996 - 2020. It is also found that the countries of Estonia, Lithuania, Pakistan, Japan, and South Korea were contributed less than 100 publications and its ranges from 23 to 78. The countries' output was compared and found that the most active period of research in OA journals of LIS is 2016–2020.



**Figure 2 Year-wise distributions of publications**

**Table 3**  
**Year-wise Growth of Publications**

S. No.	Country	Block Years								TP	S. No.	Country	Block Years								TP
		1946 to 1973	1974 to 1990	1991 to 1995	1996 to 2000	2001 to 2005	2006 to 2010	2011 to 2015	2016 to 2020				1946 to 1973	1974 to 1990	1991 to 1995	1996 to 2000	2001 to 2005	2006 to 2010	2011 to 2015	2016 to 2020	
1	Argentina	0	0	0	0	0	0	58	95	153	16	Japan	0	0	0	0	0	0	0	23	23
2	Australia	0	0	0	27	40	43	32	30	172	17	Lithuania	0	0	0	0	0	0	0	59	59
3	Austria	0	0	0	0	0	82	259	206	547	18	Mexico	0	0	0	0	0	82	148	208	438
4	Brazil	0	0	0	0	0	291	516	689	1496	19	Netherlands	0	0	0	98	199	161	119	220	797
5	Canada	0	0	0	0	0	0	383	395	778	20	Pakistan	0	0	0	0	0	0	12	47	59
6	Chile	0	0	0	0	0	0	85	130	215	21	Poland	0	0	0	0	0	0	0	120	120
7	Colombia	0	0	0	5	60	73	104	125	367	22	Portugal	0	0	0	0	0	0	0	39	39
8	Croatia	0	0	0	0	0	98	71	77	246	23	Russia	0	0	0	0	0	0	0	106	106
9	Cuba	0	0	0	0	0	0	112	180	292	24	Spain	0	0	0	0	0	103	410	432	945
10	Czech	0	0	0	0	0	0	55	73	128	25	South Korea	0	0	0	0	0	0	0	78	78
11	Estonia	0	0	0	0	0	0	0	52	52	26	Sweden	0	0	0	102	189	228	259	160	938
12	France	0	0	0	0	0	0	389	134	523	27	Switzerland	0	0	0	0	0	0	0	188	188
13	India	0	0	0	0	0	0	175	128	303	28	Taiwan	0	0	0	0	30	111	114	70	325
14	Iran	0	0	0	0	0	135	180	172	487	29	Turkey	0	0	0	0	0	0	56	55	111
15	Italy	0	0	0	0	0	0	50	385	435	30	UK	0	0	0	0	0	33	643	1172	1848
											31	US	63	273	310	320	705	1260	1857	3194	7982
												<b>Total</b>	<b>63</b>	<b>273</b>	<b>310</b>	<b>552</b>	<b>1223</b>	<b>2700</b>	<b>6087</b>	<b>9042</b>	<b>20250</b>

### 5.4. Year-wise Distributions of Citations

Table 4 shows that the year-wise distribution of citations. 31 countries have contributed 20250 publications, which got 109050 citations from 1946-2020. It is also observed that the number of publications and citations are increasing but not in a uniform manner. It is estimated that the highest number of citations (37658) in the period of 2011-2015 and the lowest number of citations (99) in the period (1946-1973). The US has received 12835 citations till 1995 whereas other countries have no publications. During 1995-2000, the other countries like Australia (68), Colombia (10), Netherlands (74) and Sweden (1153) have received the total citations of 1305. During 2011-2020, the UK has received the highest citations (25426) than the other countries (30300). overall, it is observed that the US received the highest citations of 54157 than other 30 countries (54893). It also found that the US alone received 50% of the citations during 74 years. It is also observed that from 1946 to 2011, the citations are increased but during 2016-2020 the citations are decreased by 50%.

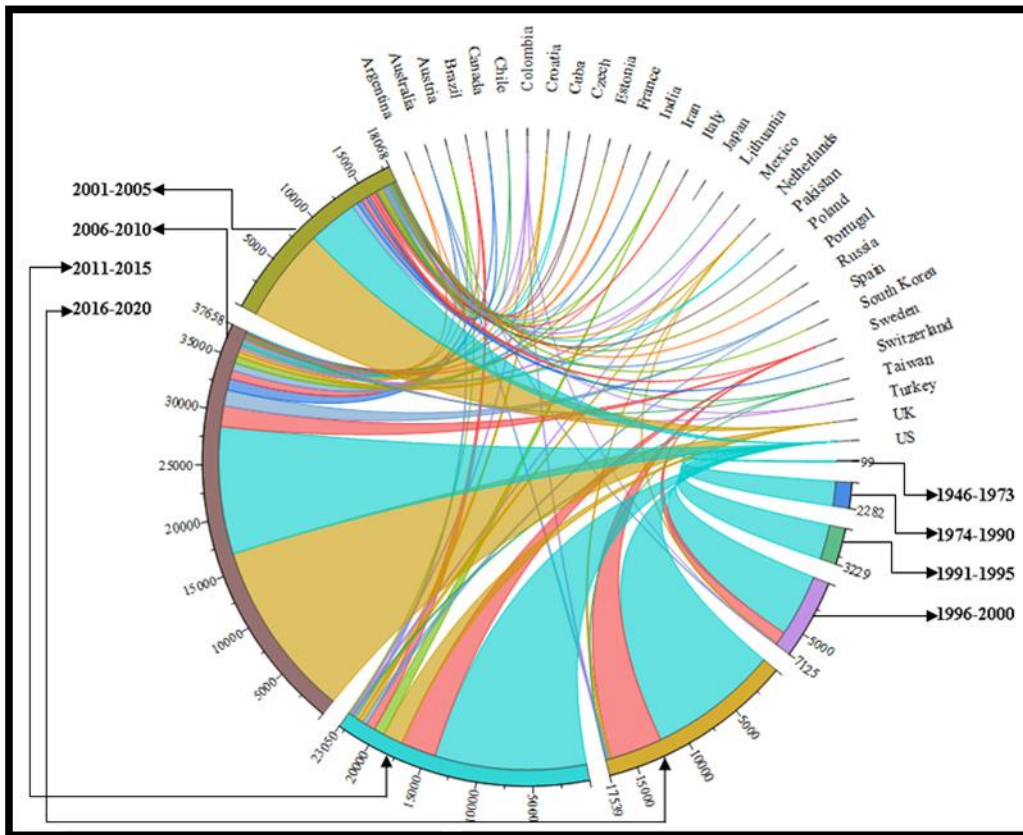


Figure 3 Year-wise Distributions of Citations

**Table 4**  
**Year-wise Growth of Citations**

S. No.	Country	Block Years								TC	S. No.	Country	Block Years								TC	
		1946 to 1973	1974 to 1990	1991 to 1995	1996 to 2000	2001 to 2005	2006 to 2010	2011 to 2015	2016 to 2020				1946 to 1973	1974 to 1990	1991 to 1995	1996 to 2000	2001 to 2005	2006 to 2010	2011 to 2015	2016 to 2020		
1	Argentina	0	0	0	0	0	0	83	39	122	16	Japan	0	0	0	0	0	0	0	0	0	0
2	Australia	0	0	0	68	165	234	123	37	627	17	Lithuania	0	0	0	0	0	0	0	0	10	10
3	Austria	0	0	0	0	0	28	88	64	180	18	Mexico	0	0	0	0	0	174	273	208	655	
4	Brazil	0	0	0	0	0	845	790	330	1965	19	Netherlands	0	0	0	74	212	383	450	233	1352	
5	Canada	0	0	0	0	0	0	1066	337	1403	20	Pakistan	0	0	0	0	0	0	21	67	88	
6	Chile	0	0	0	0	0	0	257	232	489	21	Poland	0	0	0	0	0	0	0	253	253	
7	Colombia	0	0	0	10	101	148	180	87	526	22	Portugal	0	0	0	0	0	0	0	0	19	19
8	Croatia	0	0	0	0	0	403	304	95	802	23	Russia	0	0	0	0	0	0	0	0	23	23
9	Cuba	0	0	0	0	0	0	252	131	383	24	Spain	0	0	0	0	0	406	1488	559	2453	
10	Czech	0	0	0	0	0	0	56	50	106	25	South Korea	0	0	0	0	0	0	0	0	89	89
11	Estonia	0	0	0	0	0	0	0	20	20	26	Sweden	0	0	0	1153	4892	3263	1941	462	11711	
12	France	0	0	0	0	0	0	161	14	175	27	Switzerland	0	0	0	0	0	0	0	0	471	471
13	India	0	0	0	0	0	0	732	171	903	28	Taiwan	0	0	0	0	63	179	127	47	416	
14	Iran	0	0	0	0	0	994	636	251	1881	29	Turkey	0	0	0	0	0	0	43	18	61	
15	Italy	0	0	0	0	0	0	67	323	390	30	UK	0	0	0	0	0	1854	16643	8823	27320	
											31	US	99	2282	3229	5820	12106	14139	11877	4605	54157	
												<b>Total</b>	<b>99</b>	<b>2282</b>	<b>3229</b>	<b>7125</b>	<b>17539</b>	<b>23050</b>	<b>37658</b>	<b>18068</b>	<b>109050</b>	

## **5.5. Analysis of country-wise h-index, SNIP and Cite Score**

The study has also analyzed the h-index, SNIP, and Cite Score of OA journals in LIS for country-wise, and the same is given in Table 5. The h – index was manually calculated for each country whereas SNIP and cite score were calculated for each journal in the country and added together to represent country-wise SNIP and cite score.

### **5.5.1 h-index**

Table 5 indicates that the h-index of 31 countries. The study has clearly shown that the h-index of the US (73), UK (66) and Sweden (49) is exceeded the other 28 countries and placed in the first, second and third ranks respectively. It is found that the countries of Australia, Brazil, Canada, Croatia, India, Iran, Netherlands, Spain, and Switzerland have received greater than 10 h-index and it ranges from 11 to 19. It is also found that the countries of Argentina, Austria, Chile, Colombia, Cuba, Czech, Estonia, France, Italy, Lithuania, Mexico, Pakistan, Poland, Portugal, Russia, South Korea, Taiwan, and Turkey have received less than 10 h-index and it ranges from 1 to 10. It is observed that Japan has no h-index in OA journals. It is inferred that only three countries were received the highest number of h-index ( $\geq 49$ ), nine countries were received a good number of h-index ( $\geq 10$ ) and eighteen countries were received less h-index ( $\leq 10$ ) of OA journals in the field of LIS.

### **5.5.2 SNIP**

It is clearly shown that the US has received the highest SNIP (11.147) for their academic contributions and placed in the first rank, followed by UK (11.095) ranked second and Spain (2.260) ranked third. Further, it is found that Brazil, Estonia, Italy, and South Korea have received  $\leq 1$  SNIP, and it ranges from 1.093 to 1.541. It is also found that the countries of Argentina, Australia, Austria, Canada, Chile, Colombia, Croatia, Cuba, Czech, France, Iran, Japan, Lithuania, Mexico, Netherlands, Pakistan, Poland, Portugal, Russia, Sweden, Switzerland, Taiwan, and Turkey have received  $\leq 1$  SNIP and it ranges from 0.000 to 0.175. It is inferred that only two countries were received the highest number of SNIP ( $\geq 11$ ), one country has received more than 2 SNIP, four countries were received more than 1, and twenty-four countries were received less than 1 SNIP of OA journals in the field of LIS.

### **5.5.3 Cite Score**

It shows that the UK has received the highest cite score (26.8, 39.70%) for their research performance and placed in the first rank and followed by the US has received a good number of cite score (14.9, 22.07%) and occupied the second rank while Spain (2.7, 4.00%) placed in the third rank and Italy (2.4, 3.56%) ranked fourth than other 27 countries. Further, it is found that Brazil, Chile, Iran, Netherlands, Poland, Sweden, and Switzerland have received  $\geq 1$  cite score, and it ranges from 1.1 to 1.8. It is also found that the countries of Argentina, Australia, Austria, Canada, Colombia, Croatia, Cuba, Czech, Estonia, France, India, Japan, Lithuania, Mexico,



Pakistan, Portugal, Russia, South Korea, Taiwan, and Turkey have received  $\leq 1$  cite score and it ranges from 0.0 to 0.1. It is inferred that only two countries were received the highest number of cite score ( $\geq 14$ ), two countries have received more than 2, while seven countries were received more than 1, and twenty-one countries were received less than 1 cite score of OA journals in the field of LIS.

**Table 5**  
**h-index, SNIP, and Cite Score of Countries**

S. No.	Country	h-index			SNIP			Cite Score			S. No.	Country	h-index			SNIP			Cite Score		
		Nos.	IP	%	R	Nos.	%	R	Nos.	IP			%	R	CS	%	R				
1	Argentina	4	0.589	1.40	15	0.2	0.30	27	16	Japan	0	0.000	0.00	31	0.0	0.00	31				
2	Australia	11	0.464	1.11	18	0.8	1.19	14	17	Lithuania	1	0.175	0.42	29	0.1	0.15	29				
3	Austria	2	0.584	1.39	16	0.3	0.44	23	18	Mexico	10	0.422	1.01	19	0.7	1.04	16				
4	Brazil	14	1.541	3.67	5	1.5	2.22	9	19	Netherlands	16	1.182	2.82	8	1.8	2.67	5				
5	Canada	14	0.359	0.86	22	0.8	1.19	15	20	Pakistan	5	0.227	0.54	26	0.7	1.04	17				
6	Chile	10	0.79	1.88	12	1.1	1.63	11	21	Poland	8	0.622	1.48	14	1.7	2.52	7				
7	Colombia	8	0.57	1.36	17	0.6	0.89	20	22	Portugal	2	0.375	0.89	21	0.3	0.44	25				
8	Croatia	13	0.199	0.47	28	0.9	1.33	12	23	Russia	2	0.266	0.63	24	0.2	0.30	28				
9	Cuba	7	0.299	0.71	23	0.5	0.74	22	24	Spain	19	2.260	5.39	3	2.7	4.00	3				
10	Czech	4	0.398	0.95	20	0.6	0.89	21	25	South Korea	5	1.093	2.60	9	0.7	1.04	18				
11	Estonia	2	1.187	2.83	7	0.3	0.44	24	26	Sweden	49	0.900	2.14	11	1.7	2.52	8				
12	France	2	0.000	0.00	30	0	0.00	30	27	Switzerland	10	0.723	1.72	13	1.8	2.67	6				
13	India	12	1.601	3.82	4	0.9	1.33	13	28	Taiwan	8	0.221	0.53	27	0.7	1.04	19				
14	Iran	19	0.992	2.36	10	1.5	2.22	10	29	Turkey	3	0.231	0.55	25	0.3	0.44	26				
15	Italy	7	1.447	3.45	6	2.4	3.56	4	30	UK	66	11.095	26.44	2	26.8	39.70	1				
									31	US	73	11.147	26.57	1	14.9	22.07	2				
											<b>Total</b>	<b>41.959</b>	<b>100</b>		<b>67.5</b>	<b>100</b>					

## 5.6. Authorship Productivity and Collaborative Nature

In this study, authorship productivity and collaborative nature were classified into seven different categories: Single, Two, Three, Four and Five, Six to Ten and  $\geq$  ten authors. The collaboration of authors has been analyzed, and data has been presented in table 6. It shows that the contributions of collaborative and individual publications in the field of LIS across the world. Single authored publications are noted less than 50 publications in Estonia (46), Japan (20), Pakistan (16), Poland (39), Portugal (36), South Korea (34), and Turkey (38) when compared with the other major contributing countries during the study period. Two and above authors' publications are high among all the major contributing countries except Estonia, Japan, and Lithuania. The Degree of Collaboration in publications was ranged between 0.55 and 0.92, with an average of 0.74 among all the countries. The Collaboration Index was ranged between 1.08 and 2.88, with an average of 1.82. The Collaboration Index was noted high in countries like UK, US, Spain, Sweden, Switzerland, and Brazil when compared with Netherlands, Russia, Taiwan, Portugal, Japan, Italy, Lithuania, India, Estonia, France, Czech, Chile, Canada, Austria, Australia, and Argentina. The countries of US, UK, and Brazil are the significant contributors of Publications on the LIS field. The Collaborative Coefficient was ranged between 0.04 and 0.46, with an average of 0.27, and it is high in Brazil with 0.42 and low in Lithuania with 0.04 among the major contributing countries. It is inferred that the single-authored publications are 23.58%, and multiple-authored publications are 76.42%. Hence, this study has resulted that the researchers prefer collaborated rather than individual work in the field of LIS across the world.

**Table 6**  
**Authorship Pattern Vs Country**

S. No.	Country	1	2	3	4	5	6-10	>10	CI	DC	CC	S. No.	Country	1	2	3	4	5	6-10	>10	CI	DC	CC												
1	Argentina	94	35	12	2	4	6	0	1.76	0.77	0.23	16	Japan	20	2	1	0	0	0	0	1.17	0.91	0.07												
2	Australia	93	48	19	6	5	1	0	1.76	0.72	0.27	17	Lithuania	54	5	0		0	0	0	1.08	0.92	0.04												
3	Austria	364	107	30	14	9	19	4	1.82	0.80	0.20	18	Mexico	207	127	75	13	11	5	0	1.89	0.71	0.31												
4	Brazil	429	590	299	118	45	15	0	2.21	0.61	0.42	19	Netherlands	595	141	32	13	4	10	2	1.46	0.82	0.14												
5	Canada	600	110	38	18	6	6	0	1.39	0.86	0.13	20	Pakistan	16	24	11	7	1	0	0	2.20	0.59	0.43												
6	Chile	83	79	35	13	3	2	0	1.99	0.63	0.36	21	Poland	39	43	17	14	3	4		2.29	0.64	0.41												
7	Colombia	168	97	60	24	13	5	0	2.01	0.74	0.33	22	Portugal	36	3	0	0	0	0	0	1.08	0.92	0.04												
8	Croatia	75	90	67	12	2	0	0	2.09	0.63	0.41	23	Russia	81	23	2	0	0	0	0	1.25	0.78	0.12												
9	Cuba	88	63	75	40	11	15	0	2.60	0.78	0.46	24	Spain	346	296	187	79	21	16	0	2.15	0.69	0.38												
10	Czech	105	16	2	5	0	0	0	1.27	0.88	0.10	25	South Korea	34	23	11	8	1	1	0	2.01	0.71	0.34												
11	Estonia	46	5	1	0	0	0	0	1.13	0.90	0.06	26	Sweden	433	252	150	60	22	20	1	2.03	0.73	0.33												
12	France	452	49	14	5	2	1	0	1.20	0.91	0.08	27	Switzerland	72	57	31	13	5	9	1	2.35	0.70	0.38												
13	India	117	133	41	7	3	2	0	1.86	0.56	0.34	28	Taiwan	141	145	31	7		1	0	1.72	0.55	0.31												
14	Iran	152	172	104	37	16	6	0	2.21	0.65	0.41	29	Turkey	38	48	14	7	1	3	0	2.07	0.57	0.38												
15	Italy	326	50	32	12	10	4	1	1.54	0.89	0.16	30	UK	706	400	274	171	105	166	26	2.88	0.78	0.41												
												31	US	3574	2544	1142	412	156	143	11	1.98	0.68	0.33												
<b>Total</b>														<b>9584</b>	<b>5777</b>	<b>2807</b>	<b>1117</b>	<b>459</b>	<b>460</b>	<b>46</b>	<b>2.01</b>	<b>0.71</b>	<b>0.32</b>												

(1-Single Author, 2-Two Authors, 3-Three Authors, 4-Four Authors, 5-Five Authors, 6-10 Authors, and >10 Authors)  
(CI-Collaboration Index, DC-Degree of Collaboration, and CC-Collaborative Coefficient)

## 6. Findings and Recommendations

The following are the important findings of this study

- It is found that the US has contributed the highest number of OA journals (10, 16.39%).
- It is found that the US has contributed the highest number of publications (7982).
- It is found that the UK has contributed a good number of publications (1848) by 5188 collaborative authors, resulting from an average of 2.81 authors per publication and 27320 citations, with an average of 14.78 citations per publication.
- It is found that the US has contributed a good number of publications (1848) by 5188 collaborative authors, resulting from an average of 2.81 authors per publication and 27320 citations, with an average of 14.78 citations per publication.
- It is found that the US has contributed a good number of publications (7982) by 15776 collaborative authors, resulting from an average of 1.98 authors per publication and 54157 citations, with an average of 6.78 citations per publication.
- It is found that the US has the highest number of citations (37658) in 2011-2015 and the lowest number of 99 citations in the period (1946-1973).
- It is found that the h-index of the US (73) and the UK (66) exceeded than other 29 countries.
- It is found that the US has received the highest SNIP (11.147), and the UK has received the highest cite score (26.8).
- It is found that the single-authored publications are 23.58%, and multiple-authored publications are 76.42%.
- It is found that among the collaborated works two and above authors' publications are high among all the major contributing countries except Estonia, Japan, and Lithuania.
- It is found that the Collaboration Index was reported high in countries like United Kingdom (UK), United State (US), Spain, Sweden, Switzerland, and Brazil.

In general Open Access Journals are gaining good momentum among the publishers and Institutions. But it is evident that by this study the Library and Information Science has very less number of journals in open access and that too it is very less in Indexed databases. Hence it is recommended that the quality Library and Information Science Open Access journals to be published more by the commercial publishers and also by the Higher learning institutions. This initiative will enable our LIS community to contribute more research articles in Open Access for the better visibility to the entire world. This study will be useful for library and information science students, researchers and professionals to know about the quality of OA journals and their impacts and visibility of the LIS publications in SCOPUS database.

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