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Web of Science (WoS) Indexed Library and Information Science (LIS) Journals in Scopus: An Analysis

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Abstract

Scopus and Web of Science (WoS) are the world's leading citation and indexing databases of global peer-reviewed literature in different subject disciplines. These two databases also cover scholarly literature on Library and Information Science (LIS) subject field. The purpose of this paper is to analyze the WoS indexed LIS journals in Scopus in terms of their journal metrics available in these two database platforms. Two data sources used for the present analysis are Scopus CiteScore metrics of Scopus and the Journal Citation Report (JCR) of WoS. The basic data regarding the WoS indexed journals are derived from SCImago 2020.Thus ranking of 145 Library and Information Science journals indexed in both Scopus and WoS databases are presented in the study.

Keywords: Web of Science (WoS), Library and Information Science (LIS) Journals, Scopus, Scientometric Indicators, Journal Metrics

1. Introduction

In the case of scholarly communication, Web of Science (WoS) and Scopus are the two primary citation and indexing databases which have coverage on LIS literature and are widely used to evaluate journals in the discipline based on their production as well as the total number of citations received in order to determine its impact, influence, or status (Abrizah et al., 2012). Both databases allow users to search articles on a topic, track the scholarly impact of a journal or individual author, and retrieve a list of journals in the specific field. Several journal-level metric tools are mostly generated from these two major indexing databases. The mandate of research metrics is to measure the performance at several levels, including the journal and the author levels. Such measurements are an essential part of any academic setup. There are several metrics in use and include Journal Impact Factors (JIF), CiteScore, Article Influence Factor, Eigenfactor (EF), Source Normalized Impact per Paper (SNIP), Scimago Journal Rank (SJR), h-index, i-10 index, Altmetric Attention Score, and PlumX metrics among many others. The present study is conducted to analyze the scientometric indicators such as IF, EF, H index, CiteScore, SNIP and SJR of WoS indexed LIS journals in Scopus based on SCImago 2020 database.

In addition, to retrieve the academic literature, these two databases were utilized to rank journals based on their productivity and total citations to determine the journal's impact, prestige, and influence. Web of Science from Thomson Reuters was the only citation database and publication which covered all domains of science for many years (Chadegani et al., 2013). Scopus, a database created by Elsevier in 2004, has quickly established itself as a viable alternative. Scopus is the world's largest searchable citation and abstract database, which is constantly being extended and updated. The healthy competition has led to improvements in the services offered by WoS and Scopus. Recently, various papers have compared the coverage, features and citation analysis capabilities of WoS and Scopus (Bakkalbassi, 2006). Because the indices used to rank journals in WoS and Scopus are different, it's difficult to compare the performance of all journal titles covered by both databases due to the lack of a consistent classification scheme (Abrizah, 2013).

2. Literature Review

Ali and Bano (2021) used the SJR database to analyze journal ranking and the *h* index of the Health Profession journals. The coverage of these journals in Scopus and country

ranking in the field of health professions are also analyzed in the paper. Renjith & Sudhi S.Vijayan analyzed the sixty quarter one (Q1) journals in LIS as appeared in the SCImago Journal & Country Ranking (SJR) databases for the year 2020. The top Q1 journals in LIS in respect of their scientometric indicators such as SJR, *h*-index, CiteScore and Impact Factor are discussed in the paper. It also examines the continent, country and publisher wise distribution of Q1 LIS journals in SCImago for the year 2020.

Shakil Ahmad et al. (2019) evaluated the influence and quality of Library and Information Science journals. JIF, ES, SJR, Cite Score and SNIP are used as indicator rank. Specific 89 Library and Information Science journals were collected from their class within Web of Science. Correlations amid meters were explained by Pearson's and Spearman's statistical correlations. An overall Journal Quality Index is proposed to utilize the potentiality of all various indicators used for measuring journal quality.

The study by Abrizah et al. (2013) examined the coverage, ranking, impact, and subject categorization of 79 Library and Information Science journals based on Web of Science (WoS) data and 128 titles based on Scopus data. The rank normalized Impact Factor and the Library of Congress Classification System were used to compare impact rankings and subject categorization. They identified 162 journals, with 45 journals appearing in both databases. The rankings obtained for normalized impact scores confirmed higher impact scores for titles covered in Scopus because of its more extensive coverage of titles.

3. Research Objective

Web of Science (WoS) indexed Library and Information Science (LIS) journals in Scopus are analyzed using various scientometric parameters in this work. The specific objectives of the study are;

- To identify the growth pattern of WoS indexed LIS journals in Scopus from 1999 to 2020.
- To find out the top WoS indexed LIS journals in Scopus in terms of their scientometric indicators such as SJR, CiteScore, SNIP, H index, IF and EF.

4. Methodology

SCImago Journal and Country Rank database 2020 was used as the main source to identify and collect data regarding Web of Science indexed LIS journals in Scopus. We also collected journal metrics of these WoS indexed LIS journals from Scopus Source

List on 18th May 2021. The 2020 Journal Impact Factor (JIF) and Eigenfactor Score were obtained from the Journal Citation Report (JCR) 2020 of Web of Science. Thus for each journal, we extracted SCImago Journal Rank Indicator (SJR), CiteScore, Source Normalized Impact per Paper (SNIP), *h* index, Impact Factor (IF) and Eigenfactor Score (EF). Based on SCImago 2020 database, there are one hundred forty-eight (148) WoS indexed LIS journals in Scopus. Out of which, 145 journals were chosen for the present study. Three journals are excluded from the study as one journal is discontinued, and two of them have no journal metric details in the Scopus Source List.

We also filtered the list to identify the WoS indexed Open Access (OA) and Non-Open Access (Non-OA) LIS journals. Open Access journals covered by Scopus are recognized as OA if the journal is listed in the Directory of Open Access Journals (DOAJ) and/or the Directory of Open Access Scholarly Resources (ROAD).

4.1. Scientometric Indicators

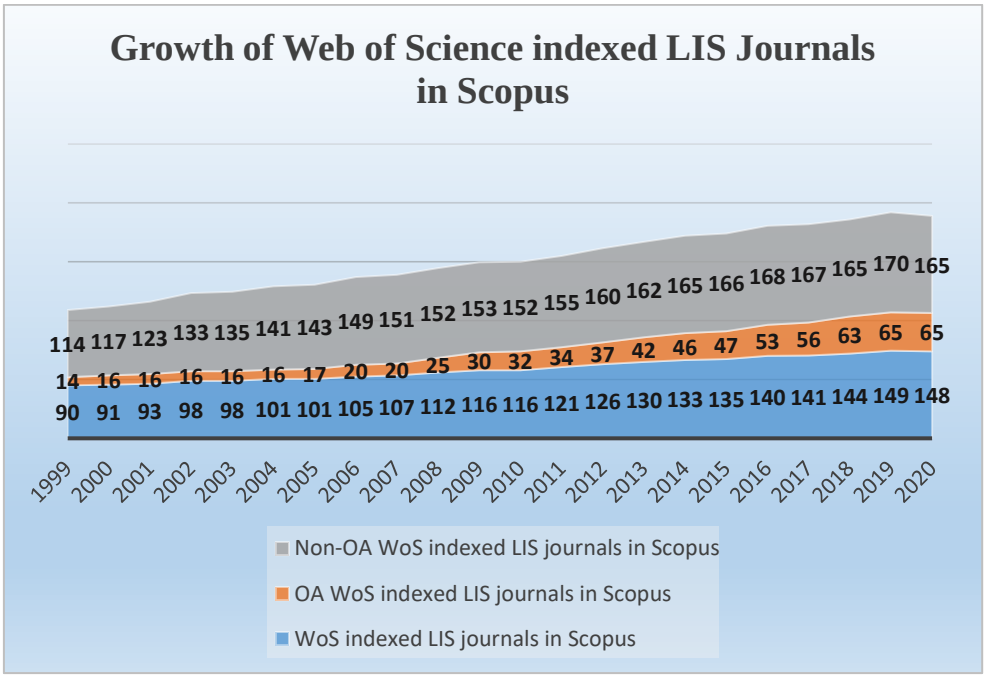
For each journal, we extracted the following metric indicators.

- **SCImago Journal Rank (SJR)**: SCImago Journal Rank measures the weighted citations received by the journal. Citation weighting depends on the subject field and prestige (SJR) of the citing journal.
- **CiteScore**: CiteScore defines as the average value of citations per item received by the items published in the journal in three previous years.
- **Source Normalized Impact per Paper (SNIP)**: SNIP measures contextual citation impact by weighting citations based on the total number of citations in a subject field.
- **H index** (Hirsch's *h* index): The largest number of (*h*) of publications that have been cited at least "*h*" times, while all other publications have less than "*h*" citations.
- **Journal Impact Factor (JIF):** In a given year, the Impact Factor of a certain journal is defined as the average value of citations per paper received by the items published in the journal in two previous years.
- **Eigenfactor Score (EF)**: A score that takes into account not only the quantity of citations but also their quality by assigning weights to the source of the citations, similar to Google's rank of websites.

5. Data Analysis and Interpretation

5.1. Growth of WoS Indexed LIS Journals in Scopus

Figure 1 shows the growth trend of WoS indexed LIS journals in Scopus. The number of WoS indexed LIS journals for the year 2020 is 148, and at the commencement year 1999, it is 90 only. It is visible that WoS indexed LIS journals in Scopus are gradually increasing year by year. Thus an increasing trend can be observed. While analyzing the growth of OA and Non-OA WoS indexed LIS journals in Scopus, a stable growth pattern is also visible.



. **Figure 1: Growth of WoS Indexed LIS Journals in Scopus**

5.2. Scientometric Indicators of WoS Indexed LIS Journals in Scopus

The scientometric indicators of WoS indexed LIS journals in Scopus are categorized under the following headings.

5.2.1. Top Impact Factor (IF) of WoS Indexed LIS Journals in Scopus

The idea of the Impact Factor was proposed by Eugene Garfield in 1955 (Garfield, 1955). The Science Citation Index (SCI) was created based on this idea in 1964, and a quantitative evaluation of scholarly journals was launched for the first time. This index is

annually announced in the Journal Citation Reports (JCR), which is currently managed by Clarivate Analytics and is widely used by academic communities.

The Impact Factor (IF) measures how frequently an average article in a journal is cited in a given year. It is used to assess a journal's importance or rank by counting the number of times its articles are cited. One way of determining the Impact Factor of a journal is by looking at the average number of times, in one year, that articles published in the previous two years have been cited. Table 1 depicts the top IF of ten WoS indexed LIS journals in Scopus.

Table 1
Top IF of WoS Indexed LIS Journals in Scopus

Journals	IF	OA/Non-OA
International Journal of Information Management	14.098	Non-OA
Government Information Quarterly	7.279	Non-OA
Scientific data	6.444	OA
Information and Organization	6.300	Non-OA
Information Processing and Management	6.222	Non-OA
Big Data and Society	5.987	OA
Journal of Information Technology	5.824	Non-OA
Journal of Cheminformatics	5.514	OA
Information Communication and Society	5.422	Non-OA
Information Systems Research	5.207	Non-OA
Mean = 6.83		

Table 1 shows that the top ten IF journals' uppermost value for the '*International Journal of Information Management'* is 4.098, followed by '*Government Information Quarterly*' 7.279. The bottommost IF value for the journal '*Information Systems Research'* is 5.207. The lion's share of the top ten IF journals has Non-OA status (7), and the remaining three are OA journals. The mean for the top ten journals' JIF is 6.83.

5.2.2. Top Eigenfactor Score (EF) of WoS Indexed LIS Journals in Scopus

In 2008, Professor Carl Bergstrom and his laboratory at the University of Washington launched the Metrics Eigenfactor Project, a bibliometric research project. The Eigenfactor measures the journal's overall importance by counting the total number of citations a journal receives over a five-year period. Table 2 clarifies the highest Eigenfactor Score (EF) of the top ten WoS indexed LIS journals in Scopus.

Table 2
Top EF of WoS Indexed LIS Journals in Scopus

Journals	EF	OA/Non-OA
Scientific data	0.034470	OA
IEEE Transactions on Information Theory	0.029130	Non-OA
Journal of Chemical Information and Modeling	0.018460	Non-OA
Information Communication and Society	0.014060	Non-OA
Scientometrics	0.013580	Non-OA
International Journal of Information Management	0.011670	Non-OA
Journal of the Association for Information Science and Technology	0.008600	Non-OA
Information Systems Research	0.006660	Non-OA
Big Data and Society	0.006650	OA
Journal of Health Communication	0.006510	Non-OA
Mean = 0.014979		

It is evident from **Table 2** that the top ten EF journals' topmost value for '*Scientific data'* is 0.034470, followed by '*IEEE Transactions on Information Theory'* is 0.029130. The lowest EF value for the '*Journal of Health Communication'* is 0.006510. The majority of the journals are Non-OA journals (8), and the remaining two have OA status. The mean for the top ten EF journals' is 0.014979.

5.2.3. Top *h*-index of WoS Indexed LIS Journals in Scopus

The *h* index was proposed by Hirsch in 2005 as a new metric for evaluating the ability of an individual researcher (Hirsch, 2005). This index is calculated using all citations received by the papers published by a specific researcher. If we arrange these papers in the order of citations received by them and if *h* papers are cited at

least *h* times, then the maximum number of *h* is the *h*-index of that researcher. Since it is possible to assign an *h*-index to the group of papers published in a specific journal in a specific year, it can be used as a journal metric. Since the *h* index is obtained by using the total number of citations of each paper, it increases monotonically with time. Table 3 depicts the top *h* index of ten WoS indexed LIS journals in Scopus.

Table 3
Top *h* index of WoS Indexed LIS Journals in Scopus

Journals	***h* index**	**OA/ Non-OA**
IEEE Transactions on Information Theory	286	Non-OA
Journal of Chemical Information and Modeling	160	Non-OA
Information Systems Research	159	Non-OA
Journal of the Association for Information Science and Technology	145	Non-OA
Scientometrics	116	Non-OA
International Journal of Information Management	114	Non-OA
International Journal of Geographical Information Science	114	Non-OA
European Journal of Information Systems	108	Non-OA
Government Information Quarterly	103	Non-OA
Information Processing and Management	101	Non-OA
Mean = 140.6		

The *h* index values of the top ten WoS indexed LIS journals in Scopus range from 101 to 286. The highest *h* index value is 286 for the journal '*IEEE Transactions on Information Theory*' followed by '*Journal of Chemical Information and Modelling'* (160). The lowest *h* index value is 6 for the journal titled '*Information Processing and Management'*. All ten journals are Non-OA journals. The mean *h* index of the top ten journals index is 140.6.

5.2.4. Top CiteScore of WoS Indexed LIS Journals in Scopus

An academic journal's CiteScore reflects the yearly average number of citations to recent articles published. Elsevier introduced this journal evaluation metric in

December 2016 as an alternative to the commonly used JCR Impact Factors (calculated by Clarivate). CiteScore is very similar to the Impact Factor. In CiteScore, the citation window period is three, whereas it is two in the Impact Factor. Another difference from the Impact Factor is that both numerator and denominator include all document types. Table 4 enumerates the top CiteScore of ten WoS indexed LIS journals in Scopus.

Table 4
Top CiteScore of WoS Indexed LIS Journals in Scopus

Journals	CiteScore	OA/Non-OA
International Journal of Information Management	18.1	Non-OA
Government Information Quarterly	11.6	Non-OA
Journal of Information Technology	11.3	Non-OA
Information Communication and Society	9.7	Non-OA
Information and Organization	9.7	Non-OA
Journal of Cheminformatics	9.5	OA
Scientific data	8.9	OA
Information Processing and Management	8.6	Non-OA
Journal of Informetrics	8.6	Non-OA
International Journal of Geographical Information Science	8.2	Non-OA
Mean = 10.42		

The CiteScore of the top ten WoS indexed LIS journals varied from 18.1 to 8.2. The '*International Journal of Information Management'* has the highest CiteScore value of 18.1, followed by '*Government Information Quarterly'* (11.6) and the '*International Journal of Geographical Information Science'* has the lowest CiteScore 8.2. The lion's share of them is Non-OA (8), and the remaining two are OA journals. The mean CiteScore of the top ten journals is 10.42.

5.2.5. Top SNIP of WoS Indexed LIS Journals in Scopus

SNIP is calculated by dividing the raw Impact per Publication ratio by the Relative Database Citation Potential. The Source-Normalized Impact per Paper (SNIP)

method quantifies the impact of contextual citations by weighting citations based on the total number of citations in a subject field. This one-of-a-kind perspective allows for a direct comparison of sources from various subject areas. In subject areas where citations are less likely, the impact of a single citation is given more weight and vice versa. It is a ratio with a denominator and a numerator. The numerator of SNIP is a journal's impact per publication (IPP). This is simply the average number of citations received in a given year by papers published in the journal in the previous three years. Table 5 elucidates the highest SNIP of the top ten WoS indexed LIS journals in Scopus.

Table 5
Top SNIP of WoS Indexed LIS Journals in Scopus

Title	SNIP	OA/Non-OA
International Journal of Information Management	4.828	Non-OA
Government Information Quarterly	3.393	Non-OA
Journal of Information Technology	3.247	Non-OA
Information Processing and Management	3.126	Non-OA
Information Communication and Society	3.114	Non-OA
Big Data and Society	2.887	OA
Journal of Informetrics	2.861	Non-OA
Scientific data	2.72	OA
Ethics and Information Technology	2.556	Non-OA
Information and Organization	2.448	Non-OA
Mean =3.118		

The SNIP of the top ten WoS indexed LIS journals varied from 4.828 to 2.448. The '*International Journal of Information Management'* has the highest SNIP value of 4.828, followed by '*Government Information Quarterly'* (3.393) and the '*Information and Organization'* has the lowest SNIP of 2.448. The eight journals are Non-OA, and the remaining two are OA journals. The mean SNIP of the top ten LIS journals is 3.118.

5.2.6. Top SJR of WoS Indexed LIS Journals in Scopus

SCImago Journal Ranking Indicator (SJR) measures a journal's impact, influence or prestige. It expresses the average number of weighted citations received in the selected

year by the documents published in the journals in the three previous years. Table 6 shows the highest SJR of the top ten WoS indexed LIS journals in Scopus.

Table 6
Top SJR of WoS Indexed LIS Journals in Scopus

Title	SJR	OA/Non-OA
Information Systems Research	3.507	Non-OA
Information and Organization	3.298	Non-OA
Information Communication and Society	2.806	Non-OA
International Journal of Information Management	2.77	Non-OA
Scientific data	2.565	OA
Big Data and Society	2.244	OA
Government Information Quarterly	2.121	Non-OA
Journal of Information Technology	1.939	Non-OA
College and Research Libraries	1.886	OA
Journal of Informetrics	1.605	Non-OA
Mean = 2.4741		

The SJR of the top ten WoS indexed LIS journals varied from 1.605 to 3.507. '*Information Systems Research'* has the highest SJR value of 3.507, followed by '*Information and Organization'* (3.298) and the '*Journal of Informetrics'* has the lowest SJR of 1.605. Seven journals are Non-OA and the remaining 3 are OA journals. The mean SJR of the top ten LIS journals is 2.4741.

6. Discussion and Conclusion

Scopus and Web of Science are the leading citations and indexing databases of peer-reviewed global scientific literature in almost all the subject fields. Besides searching the literature, these two databases are used to rank journals in terms of their productivity and the total citations received to indicate the journals impact, prestige or influence. As part of that, several journal metrics have been generated by these two databases to gauge the quality of scientific literature in different subject fields. The present study analyses the major scientometric indicators of WoS indexed LIS journals in

Scopus. The metrics are derived from Scopus Source List 2020 and the JCR of WoS 2020.

The JIF is the primary metric to evaluate the citation frequency of scientific journals. JIF measures the influence or impact of a scientific journal based on citations received by papers published by this journal. '*International Journal of Information Management'* has the highest IF value of 4.098 among the WoS indexed LIS journals in Scopus. EF is an indicator of the total influence of a journal. The EF measures the journal's overall importance by counting the total number of citations a journal receives over a five-year period. As a result, a journal that publishes a large number of articles is more likely to have a large higher EF. The journal '*Scientific data' has* the topmost EF value of 0.034470. The *h*-index was proposed in 2005 by physicist Jorge E. Hirsch to measure the impact and the individual performance of researchers based on the calculation of citations throughout their careers. The same formula was used to evaluate the journals, with the *h*-index being based on the citations received by the journal over time. Since the *h* index is obtained by using the total number of citations of each paper, it increases monotonically with time. The highest *h* index value is 286 for the journal '*IEEE Transactions on Information Theory*.'

CiteScore is very similar to the IF. It is calculated using the Scopus data and is defined as the average value of citations per item received by the items published in the journal in three previous years, rather than in two previous years as in the case of the IF. Another difference from the IF is that both numerator and denominator include all document types. The '*International Journal of Information Management'* has the highest CiteScore value of 18.1. The SNIP was proposed by Moed (Moed, 2010) as a metric that adjusts for different citation patterns across different academic disciplines. This metric is provided in Scopus and can be used instead of the IF. The '*International Journal of Information Management'* has the highest SNIP value of 4.828. The SJR is provided by Scopus together with the SNIP. SJR indicator is a size-dependent metric that calculates the prestige per paper published in a specific journal. The journal '*Information Systems Research'* has the highest SJR value of 3.507.

EF, SNIP and SJR approaches are considered more robust than JIF, taking into account how they evaluate incoming citations. The JIF approach counts all citations received without considering the significance of those citations. However, for a given

number of citations, citations from highly cited journals will result in higher values of EF and SJR. On the other hand, the SNIP approach focuses on the citation context of a subject field. The impact of a single citation, in this case, depends on the total number of citations in the subject field; that is, the value of a single citation is higher in areas where citations are less likely, and vice versa (Arencibia-Jorge, et al., 2016). Even though there are criticisms levelled against JIF, it is considered as the most relevant indicator to evaluate the influence of scientific journals.

The evaluation of the quality of research is critical for various professional organizations, individual scientists, academic institutions, and funding agencies. The SCImago journal rank indicator is a revolutionary instrument for evaluating scientific publications that may challenge the established premiership of the journal IF in ranking scientific journals. It offers unfettered (open) access, is based on a larger source journal database, and prioritizes the quality of citations received by other journals over the number of citations received (Falagas et al., 2008). Since the SCImago Journal & Country Rank (SJR) is increasingly being regarded for evaluation purposes, it is necessary to do a qualitative and quantitative analysis from both a theoretical and practical standpoint (Manana-Rodríguez, 2014). For the LIS researchers who want to publish their scholarly LIS papers both in Scopus and WoS indexed LIS journals can consider these journal metrics as criteria to select a suitable journal.

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