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Global Research Trends and Hot Topics on Library and Information Science: A Bibliometric Analysis

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Global Research Trends and Hot Topics on Library and Information Science: A Bibliometric Analysis

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Abstract

***Background and objective*:** One of the approaches to represent scientific publications in a field of science is to determine research trends and hot topics. Therefore, this study aimed to determine the research trends on the Library and Information Science (LIS) in the Scopus database during 2011-2020 and specify the hot topics in this field from July 2020 to July 2021.

***Materials and Methods*:** This study used scientometric techniques. The research population consisted of all papers in the field of LIS from July 2011 to July 2021. The data were collected from the Scopus database. The results were limited to 2011-2020 for determining the research trends in the field of LIS and from July 2020 to July 2021 for specifying the hot topics in this field. Data were analyzed using the word co-occurrence and social network analysis techniques, and UCINet, NetDraw, and VOSviewer software were used to draw scientific maps and identify core topics and individuals.

***Results*:** The keywords "Systematic Review" (frequency=531) and "Bibliometrics" (frequency=51) had the highest and lowest frequencies, respectively. "Libraries and information technology" (n=151), "research methods" (n=70), and "databases" (n=23) were the three important topic clusters in the study area, in which the United States, China, and the United Kingdom were the three most active countries, respectively. The Department of Library and Information Science, University of London, with 71 documents, and the Department of Information Management, University of Punjab, with 55 documents, had the most significant contribution of article publication among the influential institutions. Moreover, Zhang, Yut, and Wang, Liying each with 27 documents, and Li, Xiano with 24 documents were three active

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and influential authors in this field. In addition, "systematic review", "diffusion pattern", and "bibliometric" were also three hot topics.

***Conclusion*:** This study revealed that the orientation of the LIS research is going from traditional topics toward novel and emerging technologies. The results of this study can provide valuable information to researchers in LIS at the domestic and international levels.

Keywords: Library and information science, Bibliometrics, Hot topic, Scopus, VOSviewer.

Introduction

Research is the guarantor of development and progress in any scientific field so that the study of research activities in any scientific field has been considered to examine the progress of each field (Liu, G. & Yang, L., 2019). Ke et al. have observed that interest in understanding the dynamics and characteristics of scientific production and the evolution of science has increased. In this regard, Chang et al. (2015) believed that studying research trends in a discipline provides a deeper understanding of its development (Chang, Huang, & Lin, 2015). On the other hand, Goldfinch and Yamamoto (2012) provided a basis for studying research trends in a discipline by stating that "disciplines themselves are unstable and change over time" (de Granda Orive et al., 2005; Goldfinch & Yamamoto, 2012). Similar sentiments are expressed by Liu et al. (2015), who argued that to track the dynamics of scientific research, identifying intellectual structure of a knowledge domain is important. Development and/or evolution of a topic or concept, knowledge domain, or discipline can be traced by the bibliometric techniques (Marshakova-Shaikevich, 2005). Therefore, citation analysis and bibliometric studies with increasing attention to research productions have been considered by practitioners as a major approach in the evaluation of scientific productions.

Analytical units in bibliometrics consist of the number of papers, authors or researchers, institutions, journals, Keywords, and citations (including references) to track the evolution or development of science or disciplines (Bornmann & Mutz, 2015; Ferreira, Reis, & Miranda, 2015; Sun, Kaur, Milojević, Flammini, & Menczer, 2013). The key hypothesis is that the more publications, authors, institutions, topic terms, keywords, or citations in a discipline or a certain domain over a given period, the more progressive the discipline or domain (Onyancha, 2018).

Detecting hot and effective research in a scientific field is substantial considering the importance of research and the cost, time, and energy spent on research activities. The study of research topics in each field indicates which topics have received more attention during different periods, which topics have been more popular (hot topics), and which topics have received less attention (cold topics). Hot topics are, in fact, the most interesting research questions and are more important and popular for researchers which reflect research lines. These topics alter depending on the temporal conditions and occurred paradigms. They are

important indicators in determining the topical trend in scientific disciplines and discovering emerging topics, which is referred to as "Hot Topics" in international forums (Wang & Fang, 2016).

The field of LIS, similar to most of the current scientific fields, has experienced many advances and established itself as a scientific-social discipline in the scope of sciences. In recent years, discussions in this area have shifted away from a pure focus on librarianship and have reoriented toward information-related topics (Larivière, Suginoto, & Cronin, 2012). Its concepts are intertwined with other fields such as management and business, computer science, educational sciences, social sciences, psychology, and data mining (Chang & Huang, 2012).

An overview of the LIS evolution reveals the fact that sociocultural and technological variations and developments in recent decades have affected this field. Proper planning is impossible without enough knowledge of the domain literature; therefore, scientometric studies can effectively contribute to this field (Lamba & Madhusudhan, 2019). The study of the research trends and hot topics of LIS would determine the research priorities of this field and significantly assist in the development of this field (Miyata et al., 2020). Accordingly, this study aimed to determine the research trends on LIS in the Scopus citation database from 2011 to 2021 and specify the hot topics in this field in the Scopus database from July 2020 to July 2021.

Literature Review

Several studies have been conducted on the analysis of research outputs in LIS with different forms, such as articles, theses, books, and journals, and on the comparison between them in different periods using different databases and techniques. The most common technique in analyzing the content of research outputs in LIS is the co-word analysis and word co-occurrence analysis techniques (Chang, Huang, & Lin, 2015; Ferran-Ferrer, Guallar, Abadal, & Server, 2017; Hu, Hu, Deng, & Liu, 2013; Liu, Hu, & Wang, 2012).

Some studies have evaluated and analyzed LIS outputs from different aspects using content analysis or topic analysis (Günther & Quandt, 2016; Luo & McKinney, 2015; Zong et al., 2013), citation analysis (Blessinger & Frasier, 2007; Mukherjee, 2009), bibliographic and co-citation coupling analysis (Chang & Huang, 2012), and various other methods. Some of the related studies are presented in the following.

Siddique et al. (2021) conducted a 62-year review of LIS research in Pakistan. Their results suggested that the research trends in this field are evolving, and library research is also rising in Pakistan. The Department of Information Management, University of Punjab, is a significant contributor to the library and information literature, 40% of the total publications were published in two Pakistani journals; old and prestigious institutions such as the University of Punjab and the University of Karachi are leading in publishing research, and they also indicated that Baluchistan and Khyber Pakhtunkhwa provinces require more attention and budget.

In another study, Siddique et al. (2021) addressed the research productivity of LIS authors in 22 Arab countries, indicating that the highest number of studies was published in 2020. As a result of the country analysis, Kuwait with five researchers and Saudi Arabia with four researchers were rated as the top countries publishing LIS research. Kuwait University, the King Fahd University of Petroleum and Minerals, and the Imam Abdulrahman Bin Faisal University were three highly productive organizations. Academic libraries, social media, bibliometrics, information-seeking behavior, information literacy, and knowledge management were identified as researchers' main areas of interest. Moreover, recently, "Internet" and "open access" were recognized as the most popular topics. In addition, they found that the single-author model is preferred in the LIS studies.

Sun and Yuan (2020) reviewed the top papers published in the field of LIS on the Web of Science during 2009-2019. Their results showed that 501 papers, all written in English, were from 1579 authors working in 680 organizations established in 59 countries/territories. The papers were published in 40 journals in this field; MIS Quarterly, Journal of the American Medical Informatics Association, International Journal of Information Management, Journal of the Association for Information Science and Technology, and Information Management

were the top 5 journals rated by impact factor (IF). The University of Maryland (USA), the University of Wolverhampton (UK), Vanderbilt University (USA), Indiana University (USA), and Wuhan University (China) were the top 5 organizations. Authors from the USA, People's Republic of China, England, Canada, and the Netherlands had the most contributions. They also concluded that there are collaborations at the micro, meso, and macro levels based on common interests in a particular topic.

Liu and Young (2019), in a study entitled *"Popular research topics in the recent journal publications of library and information science,"* reviewed 63 journals in the field of LIS and concluded that library research has been growing in the last decade. They also showed that some keywords, including "social media," "data," "web," "public governance," "information retrieval," "information literacy," "government," "e-government," "classification," "evaluation," "collaboration," "information-seeking behavior," "assessment," "bibliography," "knowledge management," "citation analysis," "information management," "information behavior," "user studies," and "scientific communication" had been the topical trends of the field in the last decade.

Figuerola et al. (2017), in a study entitled "Mapping the evolution of library and information science (1978–2014) using topic modeling on LISA," reviewed academic products in the field of librarianship and information science at the LISA database from 1978 to 2014. According to the results of their investigation, the main topics in the field of LIS included "profession and education of information science and Scientology," "social development," "information behavior," "legal and ethical aspects," "information protection," "network communication," "advanced applications," "automated information processing," "online search services," "library management," "reference services," "cataloging and interlibrary collaboration," "historical resources," "informatics, information health," "media communication," "business management," and "knowledge management."

Kawalec (2013), in a study entitled *"Research trends in library and information science based on Spanish scientific publication 2000 to 2010,"* reviewed 10-year publications in the field of LIS. According to the results of this study, the main topics of the LIS research in Spanish in the last decade included "information resources," "information support channel," "industry," "profession," "management education," "publications," "legal officer," "librarians and users' legal aspects," "information sociology," "theoretical and general information topics," "information technology," "specialized services," as well as "archives and museums."

According to the literature review, it can be concluded that the study of research topics in the field of LIS has not been conducted in an extensive range. Research has varied according to the timing of research, and also in recent years, LIS research have shifted from traditional topics to new ones, such as digital libraries, intelligence services, innovations, and e-government.

Research Objectives

The objectives of the present study were as follows:

1. Identifying the most frequent keywords used in scientific productions in the field of LIS during 2011-2021 in the Scopus database.
2. Identifying the active countries in LIS during 2011-2021 in the Scopus database.
3. Identifying active authors in the field of LIS during 2011-2021 in the Scopus database.
4. Identifying active institutions in the field of LIS during 2011-2021 in the Scopus database.
5. Identifying the hot topics of papers in the field of LIS from July 2020 to July 2021 in the Scopus database.

Materials and Methods

Scientometrics was used in the present study to analyze LIS literature in various aspects using the scientometric software and the word co-occurrence technique. The research population consisted of all papers in the field of LIS in the Scopus database during 2011-2020. Therefore, sampling was not performed, and all retrieved papers were included in the study.

The Scopus database (via university subscription, at www.scopus.com) was visited on August 1, 2021, for the collection of data needed for the research. By applying the *Advanced search* and *Topic* field in *SOCI*, the details of all scientific articles in the field of "Library and information science (LIS)" were retrieved. These data included article title, journal name, journal impact factor, the number of received citations, corresponding author, collaborating country, the organizational affiliation of the corresponding author, and the number of keywords.

The final search strategy was as follows:

Scopus: SUBJAREA (SOCI) > Limit to ("Library and information science")

The search resulted in identifying 4729 records from the Scopus database to determine the research trends in the field of LIS. Since the Scopus data were stored in the text format, they were first entered into Bibexcel software. The AU, AD, DP, and KW tags were stored separately for the extraction process. The keyword data were entered into Ravar PreMap software for Review and filtration; this software was designed to prepare data and develop word co-occurrence matrices.

In order to determine the hot topics in the field of library and information in the Scopus database, the articles in the field of library and information were searched and analyzed in the subject area. The Field-Weighted Citation Impact (FWCI) indicator and the number of citations on the Scopus database were used to identify hot topics. FWCI represents the ratio of citations per paper and the number of citations to all papers in that subject area over three years. In the

present study, papers were identified as hot topics that their FWCI indicator was higher than two (>2) and also received the highest citations from July 2020 to July 2021. The keywords of the included papers were arranged based on "citations" and "FWCI indicator," and the "sum of the FWCI indicator and citations" was given to the keywords. The keywords were then arranged according to the highest number obtained from summing the FWCI indicator and citations. The UCINet, NetDraw, and VOSviewer software were used to draw scientific maps and identify the core topics and individuals.

The search strategy of hot papers was as the following:

TITLE-ABS-KEY ("library and information science") AND (LIMIT TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018))

Steps of Keyword Homogenization and Normalization

A total of 4729 records were retrieved from the Scopus database. A total of 12,982 keywords were obtained from these articles. Since each paper provided the keywords in different forms of writing, spelling, abbreviations, and phrases, it was required to homogenize and normalize keywords and other items using Ravar PreMap software. The following steps were followed to homogenize and normalize the keywords.

1. Among the keywords with different writing formats and synonyms, the keywords with high frequencies were selected for homogenization.
2. The country, organization, and location names were removed from the keywords.
3. Keywords with synonymous expressions were normalized, and the keywords with the highest frequency of repetitions were selected.
4. Abbreviations were converted to complete phrases.
5. Meaningless words were removed, and plural words became singular or vice versa if they had a high frequency.

After normalization, 12,384 keywords were obtained from the Scopus database.

Results

1. Identifying the most frequent keywords used in scientific productions in the field of LIS to identify the topical trend of papers

A total of 12,982 keywords were obtained from 4729 records obtained from the Scopus database, which remained 12,384 keywords following the normalization. The keywords were

analyzed using VOSviewer software and arranged by frequency, among which 178 keywords were identified as the most frequent keywords. Due to the limitations of using more keywords in the table and preventing the table from being lengthy, only 32 keywords with high frequency is presented in Table 1. According to this table, the keywords "SYSTEMATIC REVIEW" with the frequency of 531, "META ANALYSIS" with 372, and "MEDLINE" with 252 had the highest to lowest frequencies, in respective order.

Table 1. Most frequent words in the field of LIS in the Scopus database

No.	Words	Frequency	No.	Words	Frequency
1	SYSTEMATIC REVIEW	531	16	DIGITAL LIBRARIES	110
2	META ANALYSIS	372	17	RESEARCH DESIGN	108
3	MEDLINE	252	18	SCOPUS	108
4	PROCEDURES	229	19	TREATMENT OUTCOME	103
5	WEB OF SCIENCE	227	20	INFORMATION SCIENCE	88
6	COCHRANE LIBRARY	226	21	OUTCOME ASSESSMENT	87
7	RANDOMIZED CONTROLLED TRIAL (TOPIC)	214	22	ADVERSE EVENT	70
8	PRIORITY JOURNAL	198	23	LIBRARIAN	67
9	LIBRARY	189	24	DATA EXTRACTION	63
10	META-ANALYSIS	183	25	LIBRARY SCIENCE	63
11	EMBASE	160	26	HERBACEOUS AGENT	62
12	INFORMATION RETRIEVAL	155	27	EDUCATION	61
13	RANDOMIZED CONTROLLED TRIALS AS TOPIC	140	28	CONTROLLED STUDY	54
14	LIBRARY AND INFORMATION SCIENCE	130	29	DRUG EFFICACY	54
15	METHODOLOGY	113	30	BIBLIOMETRICS	51

2. Topic clusters in LIS in Scopus database

VOSviewer software was used to plot topic clusters of scientific outputs in LIS using the word co-occurrence. Since this software could not analyze 12,384 keywords, the keywords with frequencies of ≥10, i.e., 278, were selected to plot a topic map and entered into the software.

The topic clusters of the study area were formed in five general topic clusters, which included (i) libraries and information technology (n=151), (ii) research methodology (n=70), (iii) databases (n=23), (iv) the role of technology in diseases (n=23), and (v) metadata and data (n=11). Figure 1 indicates clusters with different colors.

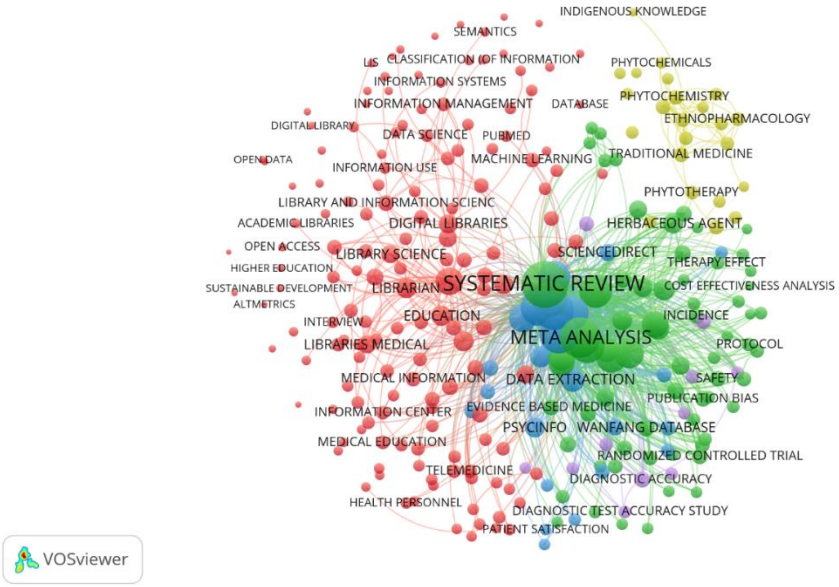

Figure 1. Topic clusters in the field of LIS in the Scopus database

As demonstrated in Figure 1, the topics in the field of LIS are divided into five clusters. The largest topic cluster is the red cluster related to the libraries and information technology with 151 members. In this cluster, there were the topics in the field of LIS that were more considered by authors compared to other topics. The members of this cluster were specified by frequency in Table 2. The words "Library," "Library and Information Science," and "Digital Libraries" were the most frequently used words in this cluster.

Table 2. A total of 30 frequent words in the largest topic cluster of LIS in the Scopus database

No.	Words	Frequency	No.	Words	Frequency

1	Library	9	16	Data Science	42
2	Library And Information Science	14	17	Libraries Medical	58
3	Digital Libraries	16	18	Practice Guideline	44
4	Information Science	20	19	Citation Analysis	45
5	Librarian	23	20	Library Services	47
6	Library Science	25	21	Big Data	48
7	Education	27	22	Public Health	51
8	Bibliometrics	30	23	Publishing	52
9	Information Management	32	24	Questionnaire	53
10	Organization And Management	33	25	Software	54
11	Academic Libraries	34	26	Information Services	55
12	Information Literacy	36	27	Data Analysis	58
13	Machine Learning	37	28	Teaching	60
14	Librarians	39	29	Information Dissemination	62
15	Publication	41	30	Qualitative Research	64

3. Identifying the active countries in the field of LIS in the Scopus database

According to the results, 88 countries were active in LIS. The United States and China were recognized as the most active countries, while Peru was identified as the least active country. The top ten active countries in this field are presented in Table 3.

Table 3. Active countries in the field of LIS in the Scopus database.

	Item	Count	Contribution (%)
1	United States	539	26.95%
2	China	395	19.75%
3	United Kingdom	142	7.10%
4	India	105	5.25%
5	Canada	94	4.70%
6	Brazil	85	4.25%
7	Iran	83	4.15%
8	Germany	75	3.75%
9	Spain	74	3.70%
10	South Africa	67	3.35%

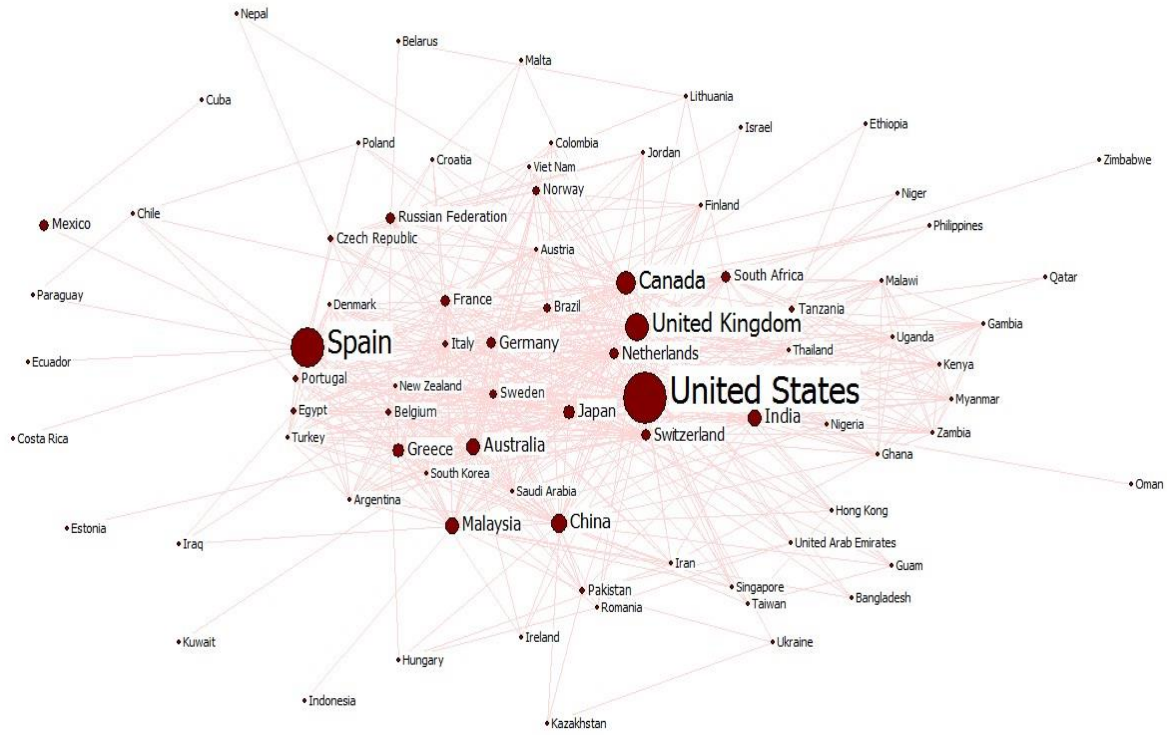

Figure 2. Co-authorship network of countries in the field of LIS in the Scopus database

As presented in Figure 2 and Table 3, the United States is at the center of this network. In addition, Spain, the United Kingdom, and Canada were active in the field of LIS; however, Peru had the minimum activity. The ranks of important countries in the co-authorship network were reported in Table 4 based on centrality indicators. As indicated, the United States ranked first, and Spain and the United Kingdom ranked second and third, respectively.

Table 4. Important countries in the co-authorship network of LIS field based on the centrality indicators from 2011 to 2020 in the Scopus database

	Item	Degree	Closeness	Betweenness
1	United States	74.074	79.412	17.682
2	Spain	41.975	62.308	10.886
3	United Kingdom	56.79	69.828	8.863
4	Canada	51.852	67.5	6.946
5	China	45.679	63.78	5.426
6	India	37.037	57.447	4.37
7	Australia	37.037	60.448	4.145
8	Greece	37.037	60	3.436
9	Japan	45.679	64.286	3.047
10	Germany	45.679	64.286	3.008

4. Identifying active institutions in the field of LIS in the Scopus database

All authors' organizational affiliations were reviewed to respond to identify active institutions in the field of LIS. The results indicated that a total of 7105 universities and research institutions have contributed to the publication of papers in the field (Table 5). According to Table 5, the Department of Library and Information Science, University of London (14.17%), and the Department of Information Management, University of Punjab (10.98%), had the most significant contributions in article publication.

Table 5. Top ten research institutions and productive universities in the field of LIS in the Scopus database

	Item	Count	Contribution (%)
1	Department of Library and Information Science, University of London	71	14.17%
2	Department of Information Management, Punjab University	55	10.98%
3	Department of Nursing, University of Florida	33	6.59%
4	Department of Medicine, University of Stanford	31	6.19%
5	Department of Information Management Science, University of National Chi Nan	24	4.79%
6	Department of Pharmacy, University of Copenhagen	24	4.79%
7	Chengdu University of Traditional Chinese Medicine	22	4.39%

8	Department of Information Management Studies, University of Shih Hsin	17	3.39%
9	Department of Botany, University of Aligarh Muslim	17	3.39%
10	Department of Computer Science, University of Oxford	16	3.19%

Due to the high volume of data, only the central cluster, i.e., 326 authors, was displayed to map the collaboration network between institutions and universities (Figure 3).

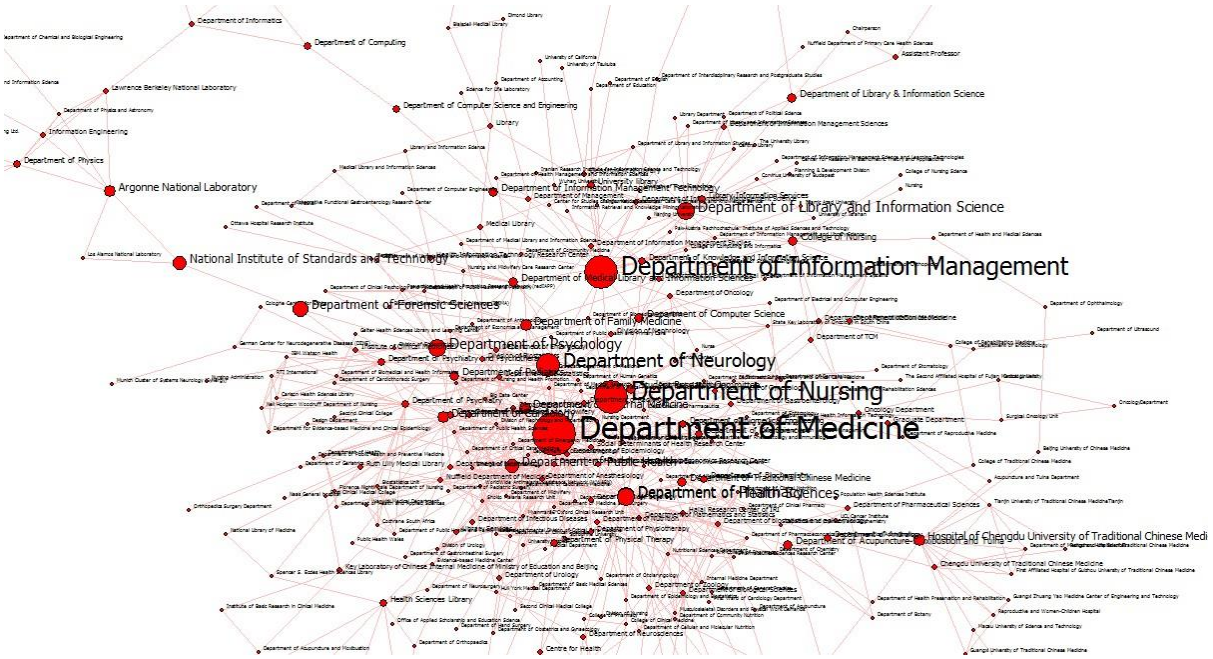

Figure 3. Collaboration network (co-authorship) of LIS institutions in the Scopus database

As demonstrated in Figure 3, the Department of Medicine, University of Stanford, Department of Information Management, University of Punjab, and the Department of Nursing, University of Florida were active and influential institutions. In addition, the Department of Medicine, the University of Stanford, is at the center of this network and has shaped the communication and scientific flow of this field between the various institutions and universities.

The central and important institutions in forming the collaboration network in the field of LIS are presented in Table 6, based on centrality indicators.

Table 6. Important institutions in the co-authorship network of the LIS field based on the centrality indicators in the Scopus database

Item	Degree	Closeness	Betweenness

1	Department of Medicine, University of Stanford	16.615	35.832	28.013
2	Department of Nursing, University of Florida	8.923	35.442	20.903
3	Department of Information Management, University of Punjab	6.769	32.146	20.776
4	Department of Neurology, University of Chicago	5.846	35.022	14.269
5	Department of Psychology, University of Stanford	4.615	30.093	10.008
6	Department of Pharmacy, University of Copenhagen	7.385	31.492	9.975
7	Department of Library and Information Science, University of London	6.462	27.473	9.327
8	Department of Health Sciences, University of York	3.692	31.832	9.268
9	Department of Forensic Sciences, University of Columbian	0.923	24.092	7.726
10	National Institute of Standards and Technology, U.S. Department of Commerce	0.923	19.841	7.177

As observed in Table 6, the Department of Medicine, the University of Stanford, is the main and most important institution in this field, as it alone has the most scientific publication in the field and the highest score in terms of degree, betweenness, and closeness centralities.

5. Identifying active authors in the field of LIS in the Scopus database

The information related to the top authors is presented in Table 7. According to this table, the literature review in the studied subject area shows that 6587 authors have contributed to the authorship of these papers; among them, ten authors had the most considerable contribution in published papers, and 252 authors with three or more papers were included in the map to plot the network. In addition, according to Table 7, Zhang Yut, Wang Liying, and Li Xiano had the most contribution.

Table 7. Ten active authors in the field of LIS in the Scopus database

	Item	Count	Contribution (%)
1	Zhang, Yut.	27	0.41%
2	Wang, Liying.	27	0.41%
3	Li, Xiano	24	0.36%
4	Liu, Yan.	23	0.35%
5	Maroyi, Alfred.	21	0.32%
6	Zhang, Xiang.	20	0.30%
7	Wang, Xu.	19	0.29%
8	Wang, Jian.	19	0.29%
9	Li, Jun.	18	0.27%
10	Li, Ying.	17	0.26%

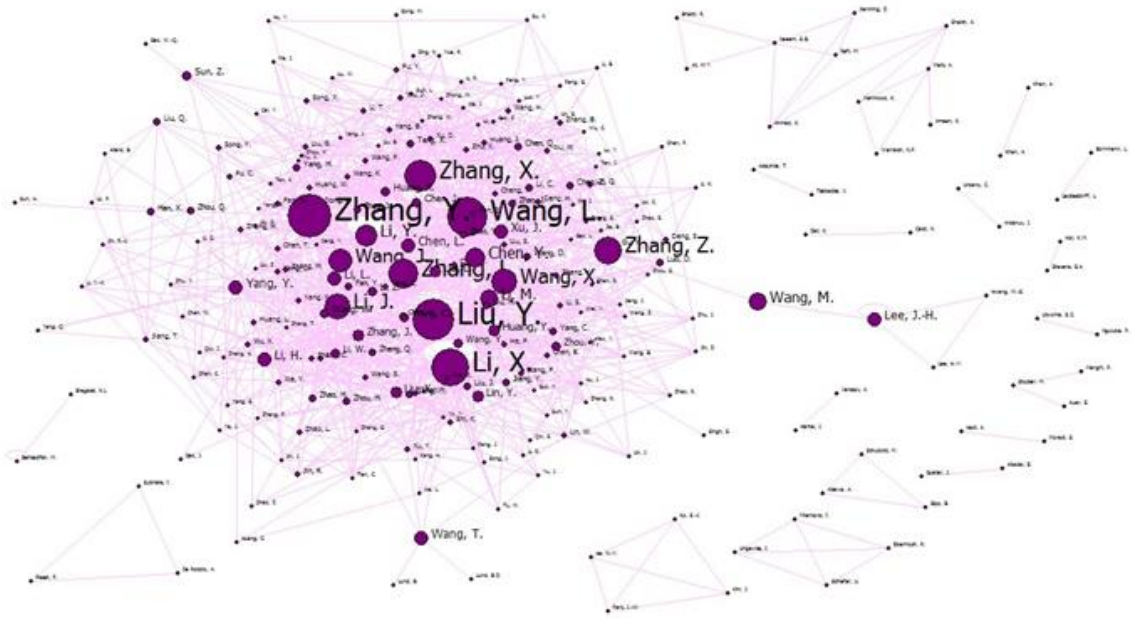

Figure 4. Collaborative network (co-authorship) of LIS authors from 2011 to 2020 in the Scopus database

According to Figure 4, the authors' collaboration network in the field of LIS in the Scopus database is well-formed in the global dimension. It seems that Scopus database has provided a detailed analysis of authors' situation. Furthermore, the main cluster in Figure 4 with 202 members indicates the high level of collaboration between the authors in the field of LIS in this database.

6. Identifying the hot topics of LIS from July 2020 to July 2021 in the Scopus database

A total of 987 records were retrieved following the search strategy developed for identifying the LIS hot topics in the Scopus database. After evaluating the records, a total of 2676 keywords were obtained from the designed data collection form. The keywords of highly cited papers and articles with the highest FWCI indicator were obtained using the data collection form. After homogenization of keywords, 98 keywords with the most citations and FWCI indicator were selected as hot topics. Finally, 30 keywords were presented in Table 8 due to the limitations and preventing the table from being lengthy.

Table 8. Thirty LIS keywords with the most citations and highest FWCI indicators from 2020 to 2021 in the Scopus database

No.	Keyword	Sum of citations and FWCI indicator	No.	Keyword	Sum of citations and FWCI indicator
1	Systematic review	156.54	16	LIS curriculum	107.21
2	Diffusion pattern	141.34	17	Information service	102.03
3	Bibliometric	142.44	18	Visualization	99.23
4	Health information	165.33	19	Disinformation	98.04
5	Thematic analysis	164.21	20	COVID-19	87.05
6	LIS research	162.03	21	Digital library	85.11
7	Fake news	143.44	22	Co-word analysis	81.21
8	Information literacy	141.33	23	Information behavior	78.23
9	Search engine	138.91	24	Knowledge management	74.12
10	LIS journal	115.33	25	Misinformation	76.23
11	Library and information science	114.23	26	Research topic	65.09
12	Information management	112.31	27	Research method	64.43
13	Digital libraries	111.12	28	Curriculum	63.31
14	Text mining	109.86	29	Public libraries	62.21
15	Social justice	108.65	30	Social media	60.21

According to Table 8, the keyword "Systematic review" (FWCI=156.54) was in the first place, and the keywords "Diffusion pattern" (FWCI=141.34) and "Bibliometric" (FWCI=142.44) ranked second and third, respectively. Information about other keywords is presented in Table 8.

Discussion and Conclusion

Scientometric studies are among the most efficient approaches to investigate research outputs and overall research status. In these studies, quantitative measurements of scientific outputs determine the number of studies and their impact in each country, institution, discipline, or by individual and hence showing their trend. Therefore, the present study aimed to determine the research trends in the field of LIS in the Scopus database during 2011-2020 and determine the hot topics in this field from July 2020 to July 2021. For this purpose, 4729 papers published in the field of LIS were extracted and analyzed by searching in the Scopus citation database.

The results indicated that the keywords "SYSTEMATIC REVIEW" and "BIBLIOMETRICS" had the highest and lowest frequencies, respectively. The LIS topics in the Scopus are divided into five topic clusters, which included (i) libraries and information technology (n=151), (ii) research methodology (n=70), (iii) databases (n=23), (iv) the contribution of technology in diseases (n=23), and (v) metadata and data (n=11) that the "Systematic review," "Meta-analysis," "Medline," "Procedures," "Web of Science, " "Cochrane Library," "Clinical Trial," as well as "Journal and Library Prioritization" were identified as the most frequent topics. Accordingly, the most significant cluster was related to "Libraries and Information Technology," and the most frequent keyword was "Library," with a frequency equal to 9. The hot topics from July 2020 to July 2021 in the Scopus database were "Systematic review," "Diffusion pattern," and "Bibliometric." According to literature, Kawalec (2013), Hu et al. (2013), and Figuerola et al. (2017) divided the LIS discipline into 11, 13, and 4 categories, respectively. In the present study, further topics were identified using the word co-occurrence technique in the Scopus database, some of which, such as Systematic review, Meta-analysis, and Cochrane library, were not identified in previous literature.

Some of the topics identified in this study were consistent with the topics identified by related studies. For example, the topic of bibliometrics in this study was in line with the topic of bibliometrics in Liu and Yang's (2019) study, which all indicate that in recent years, researchers have conducted some related studies in this field along with new developments. In addition, a comparison of the findings of the present study with the related investigations indicates that literature in the field of LIS is being changed. Moreover, as the current study

indicated, in the last decade, a great deal of focus has been on certain topics, such as publication patterns, meta-analysis, systematic review, and clinical trial in this field.

Walters and Wilder (2014) reported the United States, the United Kingdom, Spain, China, and Canada as the most active countries in the field of LIS. As concluded in the present study, the United States, the United Kingdom, and China were the three active countries in the field of LIS. According to them, the United States was at the center of activities in the field of LIS research. In the present study, the United States was also the main core in the studied field in the Scopus database because of having the most scientific publications in the field and dedicating the highest scores in terms of degree, betweenness, and closeness centrality indicators. Although China ranked second in terms of the number of papers, it conceded this position to Spain in terms of centrality indicators, showing a low level of Chinese international collaboration in this field.

The investigation of active and prolific institutions in the field of LIS demonstrated that the Department of Library and Information Science, University of London, is at the top of the table among other institutions. Department of Information Management, University of Punjab, and Department of Nursing, University of Florida, came in second and third places, respectively. The analysis results of the collaboration network (co-authorship) of the institutions in the field of LIS revealed that the Department of Medicine, University of Stanford, is at the center of this network and shaped the communication and scientific flow of this field among different institutions and universities. This department has collaborated with other institutions and could form and direct the main body of the collaboration network between different universities worldwide. Moreover, it also had the highest score in terms of degree, betweenness, and closeness centrality indicators. This conclusion is not unexpected due to the global ranking of the Department of Medicine, University of Stanford. The assessment of active authors also suggested that Zhang, Yut and Wang, Liying each has published 27 documents and thus were identified as the most prolific and influential authors in this field. Furthermore, "Systematic Review" was the hottest topic in the field of LIS during the studied years.

The comparison of recent research trends indicates that "Information storage and retrieval" was the most popular topic in the literature, and "Library and information services" was the second most popular topic in 1965, 1975, and 1985 (Rochester & Vakkari, 2003), which can be considered in line with topics such as search engine in the thematic process and information service in the hot topics of this research.

According to McNicol and Nankivell (2003), "Electronic information services," "Library and information management," "Staff development," "User needs, "non-users," "learning and information skills," "The impact of libraries and information services," "Social exclusion,

networking, and cross-sectoral working," and "Health information" are the research priorities in the field of LIS. In the present study, the keywords “Information management” and “Health information” in hot topics, as well as “Information Services” and “library science” in topical trend, were in line with the mentioned study.

According to the results of the present study, it can be concluded that the topical trend of LIS is moving towards novel and updated topics, and leading and developed countries have more research activities in this field. Furthermore, most of the top institutions are from top countries. The findings of this study could highlight the interested topics for researchers in the field of LIS globally, which can be a basis for formulating policies and research plans in line with global research. The results obtained from the present investigation can be considered in the formulation of scientific and educational policies of executors, planners, and beneficiary researchers.

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