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Visualizing intellectual patterns in LIS research : A bibliometric mapping based on major LIS journals that are intersecting with computer science

Muhammet Damar *
Information Center
Dokuz Eylul University
Türkiye

Jiban K. Pal †
Indian Statistical Institute
Kolkata
India

Tathagata Dhar §
MVJ College of Engineering
Bengaluru 560067
Karnataka
India

Jelina Haines ‡
Department of Infrastructure
University of South Australia
Australia

Güzin Özdağoğlu @
Faculty of Business
Dokuz Eylul University
Türkiye

ORCID-ID
* 0000-0002-3985-3073
† 0000-0002-2870-9180
§ 0000-0002-5236-6405
‡ 0000-0002-5453-4919
@ 0000-0003-3055-3055

E-mail
* muhammet.damar@deu.edu.tr
† jiban@isical.ac.in
§ tdtathagata@gmail.com
‡ jhaines8@gmail.com
@ guzin.kavrukkoca@deu.edu.tr

* (Corresponding Author)

Muhammet Damar
Jiban K. Pal
Tathagata Dhar
Jelina Haines
Güzin Özdağoğlu

Library and Information Science (LIS) research has gained increasing importance with the advent of information technology, and the field has been transformed by the rapid advances in this area. This study focuses on the bibliometric mapping of scholarly publications in major LIS journals that intersect with Computer Science (CS), as highlighted in scientific databases. The aim is to uncover the relationships between these two domains and explore the intellectual patterns within these clusters of knowledge. To achieve this, we analyzed the quantifiable characteristics of 14,812 publications from five leading LIS journals, extracted from the Web of Science, covering a period of over two decades (2000-2022). The findings provide valuable insights through visualization maps created using the Biblioshiny application (Bibliometrix package in R), VOSviewer, and Microsoft PowerBI tools. Title and keyword-based analyses were performed to identify the prominent areas of research. An in-depth effort was made to examine possible interactions between LIS and CS. This study stated that, based on articles over five major journals in the fields of LIS and CS, the following 21 key topics have emerged in the relevant areas; academia, methodology and analysis, citation, patent, funding/charge, open acess/ predatory/copyright, actions, applications, tools and sources, authors, metrics, indexing and rankings/awards, research, rules, theory and law, document types and objects, information and knowledge, library science, information science and management, country/region-based topics, publication, effects on scientific productivity, and technology.

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

However, in recent years, subjects like machine learning, deep learning, artificial intelligence, neural networks, social media tools, digital libraries, and library management systems have gained significant attention, particularly in journals. This study provides a comprehensive overview of publishing dynamics and emerging research trends within these domains.

Keywords: *Knowledge mapping, Scientific visualization, Publishing dynamics, Intellectual patterns, LIS vs computer science, Bibliometrics.*

1. Introduction

Academic publishing is one of the key instruments for the dissemination of scientific knowledge. The field of Library and Information Science (LIS) plays a crucial role in this process, facilitating the natural development of knowledge within the domain. Scientific publishing is essential for meeting the formal communication needs of scholars and researchers. As Mabe [1] notes, academic publishing addresses the information requirements of scholars based on their interests and behaviors.

According to Sorokowski et al. [2], academic journals are defined as a forum for scientists to present their research work. Within the scientific communication system, these journals occupy a vital position, enabling controlled contributions that promote significant publications impacting the field, whether by researchers or institutions.

Scientific journals differ from other publication forms in several fundamental ways. It is critical within the scientific community to announce developments and keep researchers informed about advancements. These journals serve various missions, including showcasing new ideas, discussing findings from theoretical or empirical studies, and announcing newly developed methods. McDermott [3] emphasized that scientific journals are often university-based and feature academic editors and advisors, following regular and standardized publishing processes.

As technology advances, an increasing number of publishers are producing electronic journals, and the readership of these electronic versions is rapidly growing. While technology transforms many aspects of journal systems, scientists continue to rely on scholarly journals for reporting their research results, acquiring knowledge, and serving as reference sources [4].

The rise in specialization, the proliferation of interdisciplinary research, and greater awareness of journal characteristics and citation metrics have intensified competition among journals to capture novel contributions [5]. In this context, bibliometric methods have become essential for tracking developments in scientific specialties and identifying emerging areas of research. This is particularly important given the heightened competition among journals to secure a position among the top-tier publications.

However, in certain fields, bibliometric analysis plays a significant role in conveying developments and serves as a reference for identifying relevant venues. Such analyses provide essential information about trends and key debates, as well as insights into changes over time. LIS is one such field where bibliometric analyses of scholarly journals have been pivotal in understanding research dynamics [6].

So this bibliometric estimation of the top five LIS journals aims to analyze prevalent areas of research to uncover relationships between these two domains, serving as a guide for researchers to explore the intellectual patterns within these two clusters of knowledge. Furthermore, given the importance of research in LIS for the advancement of knowledge, the significance of this study is further underscored.

The LIS field is often viewed as a distinct area of research. Over 193 journal titles are indexed in the Web of Knowledge (SSCI, SCI-Expanded, and A&HCI) under the "*Information Science & Library Science*" research domain. In this study, we focus on the top five LIS journals ranked by Google Scholar [7]. Several data sources identified these journals as influential venues in the field: namely, *Scientometrics*, *Journal of the Association for Information Science and Technology*, *Journal of Informetrics*, *Online Information Review,* and *Journal of Information Science*.

Notably, these top-ranked journals are also associated with the Computer Science field. The techno-globalization of information and the integration of technology into our daily lives have been significantly influenced by advancements in Computer Science, which has in turn spurred research efforts in LIS. Given this context, our study emphasizes the importance of evaluating how the computer science domain has impacted the LIS field using bibliometric techniques.

2. Scope and purpose

This study primarily aims to explore the interrelations between two closely related research domains: Library and Information Science and Computer Science, as represented in five selected journals: Scientometrics, Journal of the Association for Information Science and Technology, Journal of Informetrics, Journal of Information Science, and Online Information Review. It also provides a comprehensive examination of predominant areas and prevalent topics, thereby visualizing the intellectual patterns of major LIS journals that intersect with Computer Science.

This work eventually aims to uncover relationships between these domains and to explore the intellectual patterns within these two clusters of knowledge. So the quantifiable characteristics of the scholarly publications in these venues have been analyzed to determine the intersections between these two important research domains across different variables and distinct parameters. Notably, the authors plan to continue this study in another direction, which will be presented as part of this work

In view of the above, this paper addresses the following questions purely based on the published papers as covered in the selected journals from 2000 to 2022.

- RQ-1: What changes have occurred over time in scientific productivity and research orientation for the selected journals concerning journal impact and document types?
- RQ-2: What are the most intensively studied areas and the distribution of keywords that visualize the prevalent topics and their intersections between these two fields of research?

- RQ-3: How are these two domains related to each other, and how can we recognize the intellectual patterns among these two clusters of knowledge?

3. Materials and Method

3.1 *Data Source and Selection*

In compliance with the preset objectives, primary data for this study were collected from authoritative sources. Initially, we analyzed and selected the top-five journals in LIS that intersect with the field of Computer Science. For the purpose, we utilized Google Scholar, an open-access citation database, to select these journals based on their H5-Index and H5-Median. These criteria (unique parameters) formed the basis for identifying the top-five LIS journals. Here, the reason why the journals at the intersection of Computer Science and LIS are evaluated through Google Scholar is that Google Scholar performs a search independently of the journal indexes to which the citation is made. It offers us a more homogeneous citation evaluation. However, at this point, WoS only assigns impact values to journals according to the sources in the indexes scanned in its own indexes. However, the data of the relevant journals were obtained through WoS.

The publication dataset for these journals was retrieved from the Web of Science Database (WoS, Core Collection) as of January 25, 2023, considering all document types from 2000 to 2022. The search string used in the advanced search section of WoS is shown below in Figure 1.

The H5-Index indicates the highest value of h such that h-articles published between 2016 and 2020 have at least h citations each. The H5-Median for a publication reflects the median number of citations counted for the articles that contribute to its H5-Index. The five relevant journals, along with their respective H5-Index and H5-Median values, are as follows: [Scientometrics: H5-Index 67, H5-Median 92]; [Journal of the Association for Information Science and Technology: H5-Index 50, H5-Median 70]; [Journal of Informetrics: H5-Index 46, H5-Median 68]; [Journal of Information Science: H5-Index 37, H5-Median 49]; [Online Information Review: H5-Index 35, H5-Median 49] [7].

Ultimately, the search string returned 14,812 publication records from 2000 to 2022, providing a reasonable sample size for the study. Seven search expressions were used for the top five journals because the Journal of the Association for Information Science and Technology (JASIST) has three different titles in the database during the study period due to title changes. Interestingly, the journal 'Library Philosophy and Practice' (H5-Index 27,

so= ("Scientometrics" OR "Journal of the Association for Information Science and Technology" OR "Journal of Informetrics" OR "Journal of Information Science" OR "Online Information Review" OR "Journal of the American Society for Information Science and Technology" OR "Journal of the American Society for Information Science")

Figure 1

Search String

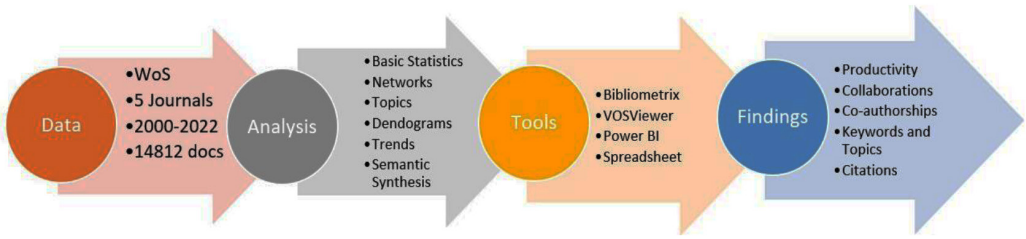

Figure 2

Top-Twenty Scholarly Journals of LIS Research*

H5-Median 34) appeared in the top twenty of the Google Scholar Research Category but is not included in the WoS collection (See Figure-2).

The journal, previously known as the Journal of the American Society for Information Science (162 publications), continued as the Journal of the American Society for Information Science and Technology (2,544 publications) from 2001 to 2013, and has been operating under the name Journal of the Association for Information Science and Technology (1,573 publications) since 2014. To account for the name changes of JASIST, bibliometric data were obtained for various periods and aligned with the current JASIST name. The dataset was processed and cleaned to ensure compliance for the analyses.

3.2 *Design of Research and Methodology*

For this study, a quantitative research design was employed, using descriptive statistics to investigate the quantifiable characteristics of the top five LIS journals as a representative sample. To capture the dataset, an intuitive method was initiated through an authoritative source like the Web of Science (Core Collection). The step-by-step design of our study is presented in a flowchart (see Figure-3), indicating a comprehensive mapping of the most authoritative communication channels in LIS research. This study explores the significant implications of the computer science field in transforming LIS research by analyzing the datasets and utilizing tools such as Biblioshiny application (Bibliometrix Package in R programming), VOSviewer, and Microsoft Power BI to derive findings and drawing insights. The data visualization capabilities of Microsoft Power BI are evidently significant in this context. Specifically, through the analysis of titles, abstracts, and keywords of articles obtained from the five major journals in the relevant field, 21 distinct topic areas were identified, reflecting the focal points of these journals. These topics are presented in a hierarchical format, which is not achievable with tools like Bibliometrix or VOSViewer. Therefore, Microsoft Power BI was preferred for its ability to offer a more personalized representation and facilitate easier data visualization in the desired manner. It can be considered an effective tool for managing bibliometric data sources. However, its use requires knowledge of data management and some programming skills.

Rank	Journal	N	Times Cited	Average per item	H Index	H5-index	H5-median	Publication years
1	Scientometrics	5,733	129,023	22.51	122	67	92	2000-2022
2	Journal of the Association for Information Science and Technology*	4,279	115,556	27.01	132	50	70	2000-2022
3	Journal of Informetrics	1,253	36,586	29.20	77	46	68	2007-2022
4	Journal of Information Science	1,443	24,903	17.26	64	37	49	2000-2022
5	Online Information Review	2,104	19,913	9.46	62	35	49	2000-2022
6	Journal of Academic Librarianship	2,669	19,369	7.26	52	35	47	2000-2022
7	Journal of the Medical Library Association	1,936	17,434	9.01	56	32	62	2002-2022
8	Journal of Documentation	1,756	19,965	11.37	56	32	46	2000-2022
9	College & Research Libraries	1,803	12,772	7.08	47	31	48	2000-2022
10	Journal of Librarianship and Information Science	1,198	5,917	4.94	31	30	42	2000-2022
11	Electronic Library	2,048	10,568	5.16	34	28	39	2000-2022
12	Learned Publishing	1,309	7,387	5.64	37	27	50	2000-2022
13	Information Development	839	5,430	6.47	29	27	44	2008-2022
14	Library Philosophy and Practice	N/A	N/A	N/A	N/A	27	34	1998-2022
15	Library & Information Science Research	951	13,596	14.30	55	26	45	2000-2022
16	Library Hi Tech	1,122	8,213	7.32	35	26	34	2006-2022
17	Health Information and Libraries Journal	871	12,126	13.92	40	25	49	2005-2022
18	Aslib Journal of Information Management	470	3,583	7.62	26	25	39	2014-2022
19	Information and Learning Sciences	217	1,097	5.06	16	24	32	2017-2022
20	International Journal on Digital Libraries	387	3,208	8.29	24	23	42	2005-2022

** Compiled froem Scholar Research Category (2022) and WoS Basic Search (2022)*

Figure 3

Defining the Workflow of Research Design

Practically, the impact of computer science serves as a motivational factor in transforming LIS research, a perspective shared by many scholars [8,9]. However, no empirical efforts have been made in this direction—hence, our study aims to provide a comprehensive overview of the period between 2000 and 2022, which holds a special significance.

Descriptive statistics and clustering-based network visualizations were used to extract information across different dimensions.The demographic structure was examined using WoS reports and queries. R programming language, along with the Bibliometrix package, was utilized to conduct cluster-based and multidimensional network analyses that explore the relationships between dimensions.It also illustrates the expert-evaluated keywords and the resulting classifications across 21 different categories.Visualization maps were created using VOSviewer,R-Bibliometrix,and Microsoft PowerBI.

The logical classification of researcher keywords in the most popular LIS journals is highly valuable for helping researchers to understand the general structure and overall landscape of the field, including topics, methodologies, academic transformations, and debates over the years. Classification was performed based on a minimum of three occurrences (repetitions), with similar conceptual usages were integrated. This classification was supported by the frequency of researcher keywords, and Microsoft Power BI was employed to evaluate these keywords and identify topic areas. In addition to Bibliometrix, SQL Query Language, and MS Excel were also utilized.

4. Finding and Discussions

4.1 *Dynamics and Trends in Literature Production*

The study focused on the publishing activities of five key journals in LIS: Scientometrics (J1; n = 5,733), Journal of the Association for Information Science and Technology (J2; n = 4,279), Journal of Informetrics (J3; n = 1,253), Journal of Information Science (J4; n = 1,443), and Online Information Review (J5; n = 2,104). Together, these journals produced 14,812 documents during the study period (see Figure 4). There is an increasing trend in publishing activities in the LIS field, with J1 and J2 playing significant roles in the production of scholarly publications. While these journals published fewer articles in the 2000s, their output has tripled in recent years. Scientometrics (J1) had the largest number of publications, quadrupling its annual output over time. In contrast, the publishing activity of Online Information Review (J5) appears to be more stable (See Table-1).

Table 1

Distribution of Publication Types in the Selected Journals

Journal	***D1***	***D2***	***D3***	***D4***	***D5***	***D6***	***D7***	***D8***	***D9***	***D10***	***D11***	***Total***
J-1	5,243	15	118	317	100	148	69	32	0	0	0	5,733
J-2	3,411	467	152	35	92	118	27	11	0	0	0	4,279
J-3	1,119	4	31	7	20	66	10	1	0	0	0	1,253
J-4	1,339	2	39	30	37	10	10	4	0	0	0	1,443
J-5	1,246	684	82	22	42	2	3	0	27	10	8	2,104
Total	**12,358**	**1,172**	**422**	**411**	**291**	**344**	**119**	48	27	10	8	14,812

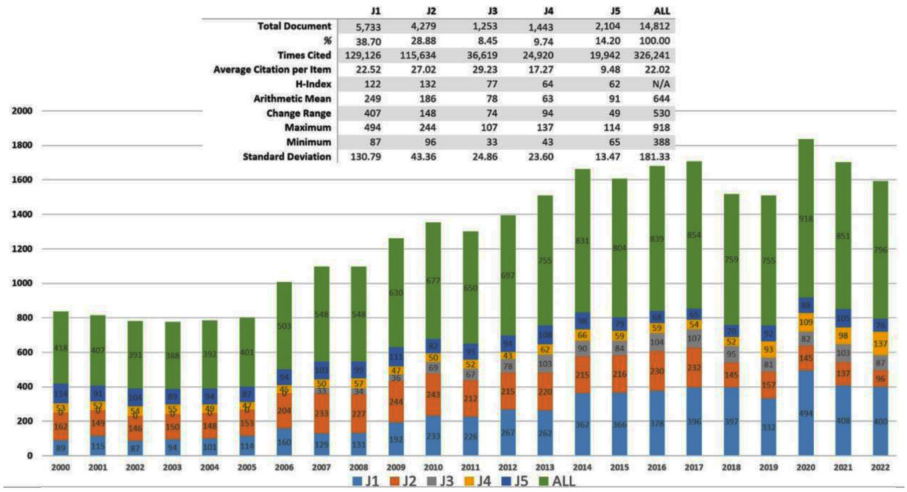

Figure 4

Counting of Publications in the Journals between 2000 and 2022

Tenopir and King [4] stated that the main objectives of journal publishing activities are (a) to collect articles that interest readers in a discipline; (b) to ensure trust and quality; and (c) to provide distribution and/or access. As a result, many journals present information about the field in various document types, including editorials, letters, comments, reviews, literature guides, and database connections, in addition to articles and review articles, to attract the attention of researchers. Table-1 shows the distribution of different document types published in the leading LIS journals, coded as Articles (D1), Book Reviews (D2), Editorial Materials (D3), Proceedings Papers (D4), Review Articles (D5), Letters (D6), Corrections (D7), Biographical Items (D8), News Items (D9), Database Reviews (D10), and Software Reviews (D11) across the five selected journals.

The citation or H-index values are important indicators of reputation for an article, journal, or individual researcher. When evaluating the relevant journals in terms of average citations per item, Scientometrics (J1: 22.52), JASIST (J2: 27.02), and the Journal of Informetrics (J3: 29.23) are above the overall average (see Figure-4). This can be attributed to the distribution of document types published in these journals over the years (see Table 1). For example, documents in the Book Review category account for 32% of the total published items in Online Information Review (J5) during this period. Additionally, the high H-index values of these journals indicate that these journals are preferred by researchers, reflecting their pursued interest in this esteemed channel of research.

According to Björk & Turk [10], a significant portion of the scientific communication process involves reporting research results in the form of drafts, conference papers, and peer-reviewed scientific articles. Research articles (D1, in Table-1) hold a prominent place among the document types. Additionally, proceedings papers (represented by D4) have been included optimally in all journals, but often published in the Scientometrics (J1).

Several scholars have noted that journals serve as a means of connecting the scientific community in various ways [11]. The impact of journals is crucial in the maturation of any discipline. Editorials, opinion articles, and letters to the editor typically provide a forum for discussing issues in the field. Journals also serve as a platform for important scientific messages and news items, such as new appointments, editor transitions, obituaries of distinguished scientists, resignations from significant positions, and groundbreaking scientific discoveries. Although these roles have been somewhat diminished by the diversity of communication options available today, journals are expected to continue playing a crucial role in meeting the information needs of the scientific community. Therefore, it is natural to find many different types of documents published in scholarly journals.

4.2 *State-of-the-Art Themes Based on Topic Structures*

For many years, librarians have questioned which groups have contributed the most to the accumulation of knowledge in their respective fields, which factors lead to publication, and the texture and diversity of these publications. It is crucial to track publication patterns across library science and related disciplines to determine who has published in which journals [12]. Here the researchers conducted various analyses, including trend analysis

based on study titles and keywords used by researchers in the selected documents, word growth analysis by year, co-occurrence analysis, dendrograms, and grouping of topic titles based on expert opinions. These analyses were carried out to illuminate this reality and provide insights into the publications in the field.

Among 14,812 articles produced in the leading journals of the field, 18,075 author-keywords were used by 19,726 different researchers from 5,288 institutions across 111 countries. The frequently used keywords in the studies were ranked by density, with the following results: such that bibliometrics (*f:*1034), citation analysis (*f:*463), scientmetrics (*f:*330), internet (*f:*306), information retrieval (*f:*332), h-index (*f:*258), altmetrics (*f:*215), social media (*f:*212), social network analysis (*f:*198), research evaluation (*f:*190), web of science (*f:*166), worldwide web (*f:*157), collaboration (*f:*155), open access (*f:*150), impact factor (*f:*149), peer review (*f:*145), text mining (*f:*136), co-authorship (*f:*129), network analysis (*f:*125), china (*f:*124), digital libraries (*f:*123), twitter (*f:*121), search engines (*f:*119), machine learning (*f:*110), citation (*f:*109), scientific collaboration (*f:*107), scopus (*f:*109), and knowledge management (*f:*107).

Figure-5 presents the trend topics and word growth analyses of publications in five journals. The topics that were intensively studied in *Scientometrics* (*J1*), *JASIST* (*J2*), *Journal of Informetrics* (*J3*), *Journal of Information Science* (*J4*), *Online Information Review* (*J5*) are listed in order by year. The word growth analysis conducted for all journals (J-all) over the years is also included in the figure.

Walters and Wilder [13] evaluated the 50 most productive authors of 31 Library and Information Science journals and identified 11 research topics with the highest number of articles, which are as follows: users and user services, publishing, technical services, bibliometrics, LIS staff and organizations, librarianship and information science, information retrieval, types of libraries, information technology, information behavior, and library management. Similar concepts were encountered in the analyses conducted in this study.

Grace et al. [14] stated that understanding the research topics that journals are likely to publish can be advantageous for authors when selecting a journal for their research work. Based on this, the topics published by each journal were analyzed periodically. In *Scientometrics (J1)* the topics that were intensively studied, especially in recent years, include machine learning, deep learning, artificial intelligence, citation recommendation, topic modeling, social media, and public universities. In the early 2000s, other prominent topics were patent statistics, academic delay, Chinese publications, author self-citations, research policy, and academic web (see Figure-5).

The analysis of *JASIST (J2)* reveals that the current trending of topics in the journal are digital humanities, data reuse, social media, online health, privacy concerns, and data management. These topics have been heavily researched in recent years. In the early 2000s, the predominant research topics included World Wide Web, citation behavior, scholarly communication, lotka's law, library information, digital libraries, and management systems. The findings suggest that the journal's focus has shifted over time, with a greater emphasis on emerging topics related to digital technology and data management.

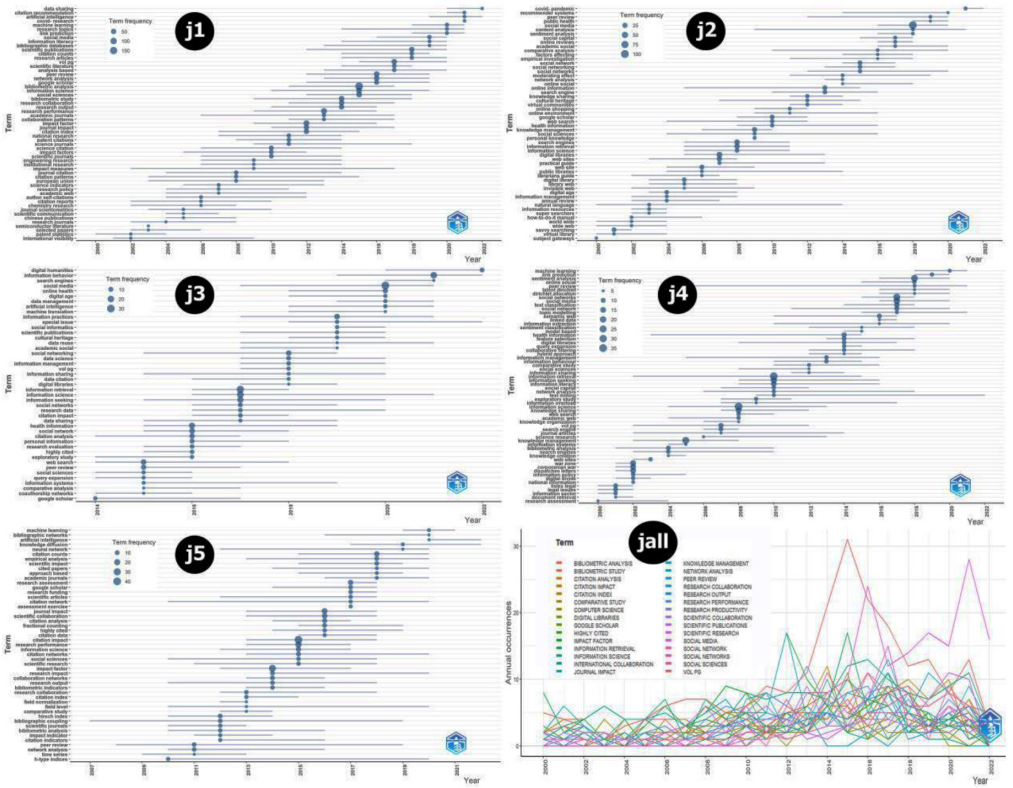

Figure 5

Analyzing Trends of the Research Issues by means Growth of Words

In the *Journal of Informetrics (J3)* the prominent topics in recent years include: journal citation, research topics, knowledge diffusion, neural network, machine learning, and artificial intelligence. The analysis shows that the main areas of research in this journal are research performance, citation impact, research output, field-level analysis, bibliographic coupling, scientific collaborations, research funding, and gender differences.

In the *Journal of Information Science (J4),* the prominent topics in recent years are machine learning, social media, link prediction, sentiment analysis, latent Dirichlet allocation, social networks, text classification, topic modeling, and semantic web. In the early 2000s the main topics intensively studied in this journal were: research assessment, document retrieval, information sector, legal issues, search engine, and the academic web.

Online Information Review (J5) has seen a rise in topics such as the COVID-19 pandemic, public health, fake news, recommender systems, network sites, social media, social capital, sentiment analysis, and content analysis in recent years. In contrast, in the early 2000s, the predominantly covered topics included virtual libraries, electronic resources, World Wide Web, information management, site design, websites, library guides, and online search. Throughout the years, the journal has also highlighted topics of Latin America, social

media, online information, social sciences, academic libraries, data mining, information literacy, and health information.

To wrap up, holistically, the intense research topics are found to be citation analysis, bibliometrics, information retrieval, the internet, scientometrics, h-index, altmetrics, research evaluation, scientific impact, social media, social network analysis, impact factor, scientific collaboration, twitter, machine learning, artificial intelligence, search engines, libraries, and research performance. The prominent research topics in these journals in recent years are misinformation, open access, machine learning, artificial intelligence, data mining, and text classification (Figure-5, J-all).

By evaluating author keywords and concepts, and using software tools to identify related concepts, 21 classes have been created by domain experts, as presented in Figure-6. The relevant main classes are as follows: academia *(1)*, methodology and analysis *(2)*, citation *(3)*, patent *(4)*, funding/charges *(5)*, open acess/predatory/copyright *(6)*, actions *(7)*, applications, tools and sources *(8)*, authors *(9)*, metrics *(10)*, indexing and rankings/awards *(11)*, research *(12)*, rules, theory and law *(13)*, document types and objects *(14)*, information and knowledge *(15)*, library science *(16)*, information science and management *(17)*, country/region-based topics *(18)*, publication *(19)*, effects on scientific productivity *(20)*, and technology *(21)*.

The list is filtered based on author keywords used at least three times. As a result, a comprehensive evaluation is presented, covering topics related to technical or methodology-related studied in LIS, types of sources, theories or laws, and countries that stand out in terms of subject matter or productivity in the field. This list can be served as a guide for researchers currently working or planning to work in the LIS field, indicating the topics covered in the journals and their respective focus levels.

With the increasing ability to effectively find and use information, along with the support of technology, access to information is transforming society [15]. The collaboration and assistance of librarians is a foundation for the development of any movement in terms of information expertise; thus, providing useful information to society fosters development [16]. Lund and Wang [6] emphasize the importance of understanding the research methods used by LIS researchers to capture historical changes in thinking about empiricism within the discipline.

The applications, tools, sources and 'methodology & analysis' classes serve this purpose especially well. The types of analyses and methods primarily used in the studies are: bibliometricss, altmetrics, meta-analysis, systematic literature review, scoping review, scientometrics, patent analyses, data mining, web mining, cluster analysis, deep learning, natural language processing, semantic web, machine learning, text mining, patent mining, classification, normalization, topic modeling, latent Dirichlet allocation, naive Bayes, correlation, regression, content analysis, thematic analysis, sentiment analysis, opinion mining, co-citation analyses, co-occurrence, and co-word analysis.

In Hurd's [17] study, it was stated that new technologies have brought about radical changes in the scientific communication process. Chaddha and Kanjilal [8] noted that advances in information technology and increased internet usage have significantly

changed the nature of academic libraries and information behaviors. In our study, these changes have been comprehensively evaluated through bibliometric tools. These tools have revealed that technological developments have been periodically discussed in the fields such as big data, the metaverse, computer science, nanotechnology, artificial intelligence, communication, e-learning, human-computer interaction, user satisfaction, the Internet of Things, mobile devices, technology acceptance model, electronic commerce, and emerging technology [18, 19].

Additionally, studies that have used bibliometric tools or analyses have gained more traction in the literature compared to scientometric studies in leading LIS journals. VOSViewer was found to be the most commonly used bibliometric tool, particularly after 2010. The fields of data science and information science are inherently interwined. The mission, tasks, and nature of data science align with those information sciences, as they largely overlap and share similar concerns, complementing each other [20]. The findings obtained in this study support these assertations.

In the studies, citation topics are generally evaluated within the framework of citation contexts, citation databases, citation function, citation networks, self-citations, highly cited papers, and similar categories. The tools used have been facilitated the derivation of research trends, collaboration networks, link predictions, sentiment analysis, opinion analyses, societal impact, intellectual structures, and related conclusions [21, 22].

The study by Malekabadizadeh et al. [16] emphasized that scientific institutions and organizations are key factors in development. Therefore, evaluating these institutions is considered valuable for sustainable scientific development. In this study, ranking systems

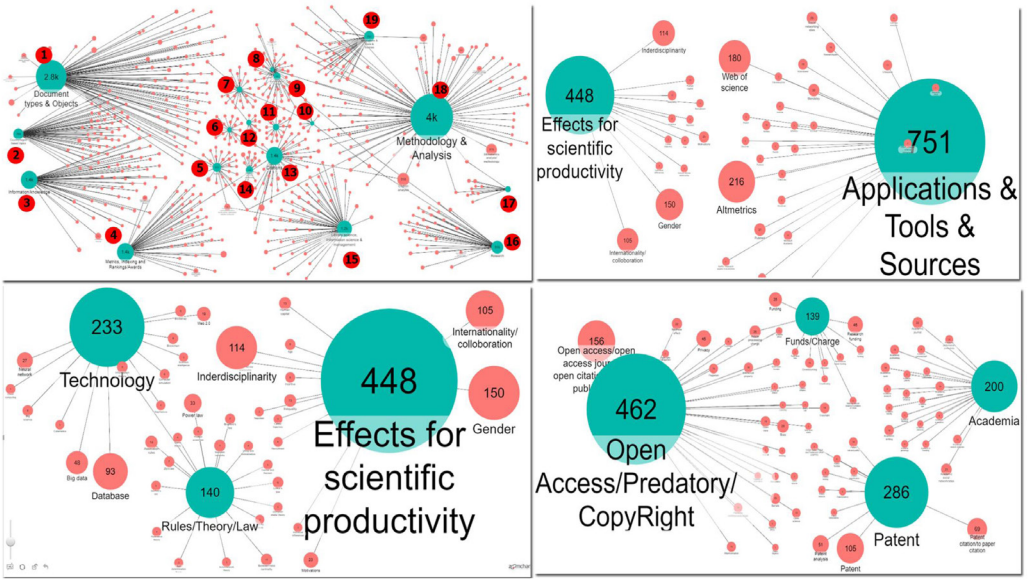

Figure 6

The Prominent Topics of Related Research

such as ARWU, Leiden rankings, Shangai Rankings, and Times Higher Education were identified in this context. Alongside university rankings and ranking systems, the study focused heavily on science policy, scientific production, research funding, collaboration, authorship, international collaboration, internationalization, citation network, networks, social networks, social network analysis, network analyses, scholarly collaboration, universities, and higher education as major subject areas.

In recent years, there has been an increasing trend in collaboration across different fields and a rise in the number of authors from various disciplines in articles [23]. Such analyses are widely used in the LIS field, which is a critical for monitoring scientific productivity and measuring collaborations [24, 25]. In the publications examined in this study, not only are university relationships and productivity evaluated, but also university-industry collaborations are also scrutinized [26].

As observed, LIS has emerged as an important area of discussion regarding university performance and institutional interaction. In addition to determining scientific productivity, relevant studies also establish relationship related to this area, with many advocating for a science productivity policy. The position of higher education institutions in scientific ranking systems and the prominence of journals in the field are also evident. In particular, the social impact of higher education's scientific outputs and the transfer of knowledge are examined through the triple-helix model, addressing a variety of research questions.

The terms, such as the Matthew effect [27] and research fronts [28] hold significant positions in the literature. The evaluation of direction-setting researchers or prominent research in the field has been carried out in terms of citation analysis, h-index, co-authorship, highly cited papers, co-citation analysis, citation impact, indicators of quality, research policy, research trends, research productivity, research impact, and research performance, all of which are related to research evaluation.

Furthermore, the study discusses academic genealogy and academic career development, as well as scientific productivity and academic collaboration in terms of academic mobility. It sheds light on many different debates in areas such as diversity, age, youth, gender, psychology, culture, disciplinary differences, humanities, management, ethics, education, economics, the triple helix, social capital, sociology of science, social sciences, and education. It is often questioned whether the presence and productivity of women in these areas are influenced by gender differences in scientific productivity in certain professional groups, research areas, specific time periods, or under extraordinary circumstances.

In related journals, bibliometric studies have primarily been conducted in the natural and basic sciences, covering topics such as exergy, entropy, ecology, chemistry, energy, mathematics, physics, and biotechnology, as well as computer science. Through these methods, discussions on the development of the relevant field, scientific collaboration, and prominent topics have taken place. Studies from medical fields such as biomedicine, health, cancer, public health, health information, COVID-19, and bioinformatics have also been published in these journals.

Another notable finding in the studies is the impact factors of the journals. In this context, shared journal impact factor, journal citation reports, citation counts, indexing, Scientific Journal Rankings, journal metrics, and the eigenfactor are important. Journal selection is critical for researchers across all fields, as it determines which types of studies will be considered valuable enough to be published in high-impact journals [25, 29]. With the increasing number of new universities and programs, competition in the field is also rising. This situation can be viewed as a positive influence on the quality of publications in prominent journals. In their study, Schlögl and Stock [30] highlighted the differences between practitioner and academic LIS journals, noting that practical content and more academic studies have different criteria.

Grace et al. [14] emphasized the need for open incentives, as increasing research costs and difficulties in obtaining funding can pose significant barriers to conducting and publishing research. At this point, concepts such as open data, open access [31, 32], and open science [33] emerge. It is clear that these relevant topics have found their place in leading journals in the LIS field. Prominent themes include visibility, intellectual property, usage, copyright, serials, open data, open government, linked open data, open science, open access, open access journals, open access publications, open peer review, open systems, open source, and open software. The sources of the data analyzed in the study and the fields evaluated include public libraries, academic libraries, digital libraries, the internet, social media, Web of Science, Scopus, Google Scholar, Twitter, the World Wide Web, Google, YouTube, Facebook, PubMed, Microsoft Academic, ResearchGate, Wikipedia, blogs, portals, websites, databases, and journals.

The distribution and placement of information has been important issues for the LIS field from the past to the present. In our study, relevant topics such as information seeking, information behavior, information retrieval, information access, information discovery, information dissemination, information processing, information management, information disclosure, information extraction, information literacy, knowledge performance, information networks, information quality, information searches, information services, information society, information visualization, information infrastructure, information filtering, information media, information needs, information operations, information policy, information overload, knowledge engineering, knowledge production, knowledge graphs, data security, knowledge diffusion, and knowledge transfer stand out.

More specifically, the LIS research field encompasses a variety of terms, methods, theories, and laws that can be used to explore prominent topics, researchers, institutions, journals, funding organizations, and countries across various domains. Among these terms and topics, ethical issues also arise in different areas. Our study revealed that possible problems in scientific productivity, such as self-citations, journal evaluation, academic publishing, publication patterns, publication ethics, publication delays, and predatory journals have been identified in the leading journals of the field [34, 35]. Therefore, it is essential to emphasize that the significance of the LIS field is evident in the discovery of anomalies but also in protecting the field from academic irregularities and advancement of science in a more consistent manner.

5. Concluding remarks

This work involves a comprehensive evaluation of five prominent journals in the field of LIS. A detailed assessment of intellectual patterns is presented based on the publications produced by these journals, using bibliometric tools and techniques. This study will be aid in understanding the impact of Computer Science on LIS. However, the findings have significant implications for identifying converged areas and prominent topics of research having their mutual interest in both the fields.

The results have permitted too many conclusions of broad generalizations of learned behavior and the contributions of these journals from different perspectives. The study reflects on current technological developments and the methods or techniques that contributed to these developments by intersecting the combined research agendas of LIS and Computer Science. Certainly, it hold a special significance, as it focuses on the intersecting channels of communication labeled in both LIS and Computer Science fields, rather than on any specific research domain. It also differs from previous works by providing a thorough evaluation of the influence of Computer Science on the LIS field, thus systematically developing insights through text-mining techniques that cover research trends in multiple directions

In conclusion, this study highlights that, based on articles from five major journals in the fields of LIS and Computer Science, 21 key topics have emerged, with recent years seeing an increasing focus on subjects such as machine learning, deep learning, artificial intelligence, neural networks, social media tools, digital libraries, and library management systems, particularly in computer science-related journals. Furthermore, the potential of artificial intelligence technologies, which have increasingly become part of our lives in recent years through deep learning, machine learning, and various other techniques, to transform the field of LIS should not be overlooked. In particular, areas such as automatic content analysis and classification, personalized information access, management of information resources, automated literature reviews, and improvements in efficiency of library and information services through AI applications are expected to emerge as key topics that warrant further examination by domain experts.

Conflicts of Interest

There is no potential conflict or competing interest. Indeed no part of this work can be used anyway ignoring the spirit of the authors, and subsequent academic interests therein.

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