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Cartographying artificial intelligence in library and information science: A bibliometric comparison of pre-and post-2022 research trends

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Abstract
This study examines the evolution of artificial intelligence (AI) research in Library and Information Science (LIS) through a comparative bibliometric analysis of pre- and post-2022 research trends. The study focuses on two distinct periods: the pre-2022 period, covering 2016 to 2021, and the post-2022 period, covering 2022 to 2026. Data were collected from the Scopus database, with the analysis limited to English-language articles and review papers. The study investigates publication output, citation patterns, authorship trends, collaboration index, contributing journals, and keyword-based thematic developments. The findings reveal a substantial increase in AI-related research in LIS after 2022. The pre-2022 period recorded 43 publications, while the post-2022 period recorded 381 publications, indicating a major expansion of scholarly attention in this area. The analysis also shows a rise in total citations and number of authors, along with a moderate increase in collaboration. However, the average citation per paper declined in the post-2022 period, mainly due to the recent publication of many studies. The keyword analysis further indicates a thematic shift from foundational AI applications, such as machine learning, expert systems, and library services, toward emerging concerns related to generative AI, ChatGPT, AI literacy, information literacy, digital transformation, and ethical issues. The study offers insights into the changing direction of AI research in LIS and supports future research on AI-driven library practices and services.
This keeps the original result and findings unchanged, including the Scopus-based comparison and the 43 versus 381 publication count.

Keywords: Artificial intelligence, library, AI in libraries, Pre and post AI Era, efficiency, ChatGPT

Introduction

The use of artificial intelligence has expanded rapidly across sciences, social sciences, arts, and several other fields. Library and Information Science is also part of this wider transformation. The LIS field has integrated AI in areas such as information retrieval, user perception, user need analysis, process automation, decision-making, and other related functions. Over time, AI integration in LIS has developed from expert systems and machine learning to natural language processing and intelligent information systems and services.

The emergence of recent AI technologies, particularly after 2022, has brought new perspectives to this field. Although many studies have examined AI integration in libraries, there is still a lack of comparative analysis showing how the trend of AI integration changed before and after the widespread emergence of generative AI.

To address this gap, the present study conducts a comparative bibliometric analysis of AI-related research in LIS using data from the Scopus database. The dataset is divided into two distinct periods: Pre-2022 period: 2016-2021 & Post-2022 period: 2022-2026.

This division is used to examine differences in publication trends, authorship patterns, and thematic development.

Using bibliometric analysis and visualization, this study attempts to map the intellectual structure of the field and identify emerging trends within the research domain. The results are expected to provide insight into the current state of artificial intelligence research in LIS and help align future research with technological innovations.

Literature Review

The application of artificial intelligence (AI) in Library and Information Science (LIS) has received increasing attention over the past decade, especially with the advancement of digital technologies and data-driven systems. Earlier studies mainly focused on AI techniques such as machine learning, natural language processing, and expert systems for improving information retrieval, cataloguing, and user services in libraries (Das & Islam, 2021) [2]. These studies highlighted the potential of AI to improve efficiency, automate routine tasks, and support decision-making in library environments.

Along with application-based research, several bibliometric studies have examined the growth and development of AI-related research within LIS. These studies generally report a steady increase in publication output, as well as the emergence of diverse research themes and collaborative patterns among authors (Kalita *et al*., 2024; Islam *et al*., 2025) [4, 5]. The findings indicate that AI has become a significant area of interest in LIS, with contributions across digital libraries, information systems, and knowledge management. However, most of these analyses examine the development of AI research as a continuous process and do not distinguish between different phases of technological change (Torres & Peñaflor, 2026) [8].

Recent discussions in the literature have begun to highlight the transformative impact of generative AI technologies, particularly after 2022. Tools such as ChatGPT and other large language models have created new possibilities for content generation, user interaction, and information access in libraries. These developments have also encouraged new

research themes, including AI literacy, ethical issues, and the role of AI in academic and research support services (Hajkowicz *et al*., 2023) [3]. Despite these developments, there remains a need for comparative studies that systematically examine how research trends shifted before and after the emergence of generative AI.

Therefore, a clear research gap exists in understanding the evolution of AI research in LIS across different technological phases. The present study addresses this gap through a comparative bibliometric analysis of pre- and post-2022 research trends, offering insight into changing dynamics, thematic shifts, and collaborative patterns in the field.

Methodology

This study adopts a bibliometric research design to examine the evolution of research on artificial intelligence (AI) in Library and Information Science (LIS). Since the purpose of the study is to identify changes in publication growth, research focus, authorship patterns, and thematic development over time, a comparative bibliometric approach was considered appropriate. The study compares AI-related LIS research across two distinct time frames: the pre-2022 period, covering 2016 to 2021, and the post-2022 period, covering 2022 to 2026. The data for the study were retrieved from the Scopus database, which was selected because of its broad coverage of peer-reviewed scholarly literature across disciplines. The search was limited to articles and review papers published in English in order to maintain consistency in document type and language. All retrieved records were exported in CSV format and included bibliographic details such as authors, titles, abstracts, keywords, citations, and source information. Data for 2026 were included as partial records available at the time of extraction. To make temporal comparison possible, the dataset was divided into two phases: the pre-2022 phase, covering 2016 to 2021, and the post-2022 phase, covering 2022 to 2026. The year 2022 was selected as the dividing point because of the rapid development and wider visibility of generative AI technologies, which influenced later research topics in LIS. The study used both descriptive and network-based bibliometric methods. Performance analysis was conducted through indicators such as publications per year, top keywords, top journals, average citations, and collaboration index. In addition, keyword-based bibliometric analysis was used for science mapping to identify major research themes and shifts in research direction. The data were analyzed using Excel. The study is limited to publications indexed in the Scopus database, and only English-language publications were included. Therefore, research published in other databases, languages, or document types falls outside the scope of the present analysis.

Data Interpretation: The data retrieved for the study show a clear and substantial increase in research output on artificial intelligence in Library and Information Science after 2022. In the pre-2022 period, covering 2016 to 2021, 43 documents were retrieved, whereas in the post-2022 period, covering 2022 to 2026, 381 documents were retrieved. This indicates unprecedented growth in publication output during the post-AI period, with the number of publications increasing from 43 to 381. In terms of yearly average, the pre-2022 period recorded nearly 7 papers per year, while the post-2022 period recorded nearly 77 papers per year. This significant increase can be attributed to the transformative impact of generative AI technologies, particularly tools such as ChatGPT, which created new research interest and encouraged wider scholarly engagement with AI-related issues in LIS. The keyword analysis of the pre-2022 period also indicates that research during 2016 to 2021 was mainly focused on foundational AI technologies and their application within traditional library contexts. The frequent use of the keyword "artificial intelligence," along with terms such as "machine learning" and "expert systems," suggests that this period represented an early adoption phase of AI in the field. Similarly, the presence of terms such as "libraries," "academic libraries," and "librarians" shows that most studies were situated within institutional library settings. The use of terms such as "library services" and "information services" further suggests that the major focus of research during this period was on improving conventional library operations, enhancing service delivery, and exploring the practical use of AI in established library systems.

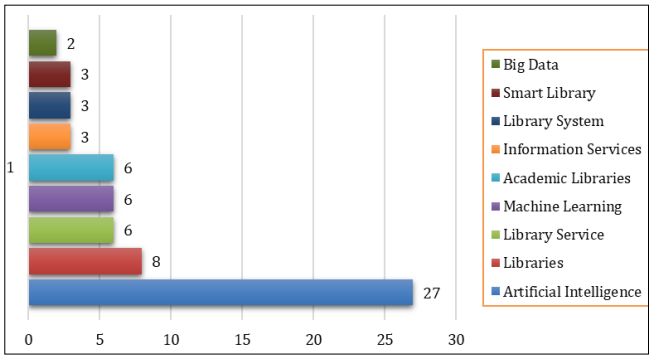

Fig 1: Top Author Keywords in AI and Library Research (2016–2021)

Post-2022 period: The keyword analysis of the 2022-2026 dataset shows major changes in AI-related research within LIS. Although 'artificial intelligence' remains the dominant keyword, advanced terms such as 'ChatGPT' and 'generative artificial intelligence' gained prominence. At the same time, keywords such as 'artificial intelligence literacy,' 'information literacy,' and 'digital transformation' show growing attention to user-oriented and user-focused studies. The presence of the keyword 'ethical issues' reflects increased concern about the responsible use of AI. Overall, the keyword analysis indicates a clear thematic shift from the pre-2022 period to the post-2022 period.

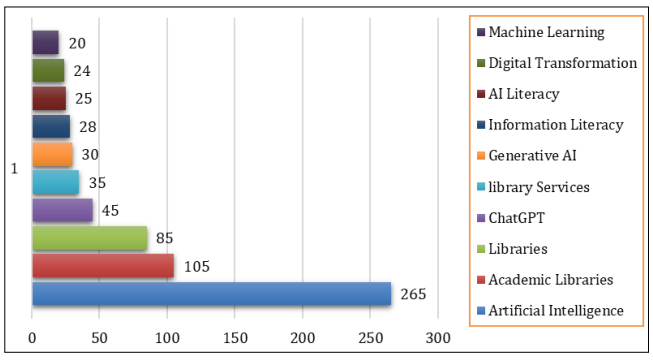

Fig 2: Top Author Keywords in AI and Library Research (2022–2026)

Themes generated for pre-2022 era from keyword analysis
Theme 1: Artificial Intelligence Technologies and Big Data
Key Terms: artificial intelligence; robots; big data
Topic: Basic technologies that enable early use of AI in libraries

Theme 2: Library Systems and Smart Library
Key Terms: library system; smart library
Topic: Implementation of intelligent technology within library systems

Theme 3: Library & Information Services via Artificial Intelligence
Key Terms: library services; information services
Topic: Utilization of artificial intelligence to improve traditional services

Theme 4: Applications to Academic Libraries
Key Terms: academic libraries
Topic: Primary area for application of these technologies.

Themes generated for post-2022 era from keyword analysis
Theme 1: Generative AI and Advanced AI Technologies
Keywords: artificial intelligence; generative artificial intelligence; machine learning; ChatGPT
Theme focus: Development of advanced and generative AI technologies fueling research

Theme 2: Artificial Intelligence and Literacy of Users
Keywords: artificial intelligence literacy; information literacy
Theme focus: Change in focus from AI to skills and literacy of users

Theme 3: Technology in Libraries
Keywords: digital transformation; technology; smart libraries
Theme focus: Transformation of libraries into technology ecosystems

Theme 4: Library Services and Profession and library ecosystem
Keywords: library services; librarians; libraries and information science; academic libraries; libraries.

Analysis of Top Contributing Journals
Pre-2022 Era
Top Contributing Journals
Library Hi Tech News (7)
The Electronic Library (5)
Library Philosophy and Practice (4)
Library Hi Tech (3)

Moderate Contributors
Journal of the Association for Information Science and Technology (2)
Information Services and Use (2)
Journal of Academic Librarianship (2)
Journal of Chemical Information and Modeling (2)
Occasional Contributors
Journal of the Medical Library Association (1)
Medical Reference Services Quarterly (1)

Post-2022 Era
Core (Highly Productive) Journals
Library Hi Tech News (51)
Journal of Academic Librarianship (30)
IFLA Journal (16)
Proceedings of the Association for Information Science and Technology (15)
Strong Supporting Journals
Journal of Librarianship and Information Science (12)
The Electronic Library (11)
Technical Services Quarterly (10)
Library Trends (9)
Journal of Library Administration (8)
Library Hi Tech (8)
Emerging Contributors
Global Knowledge, Memory and Communication (7)
Science and Technology Libraries (6)
Journal of Web Librarianship (6)
Health Information and Libraries Journal (6)
Information Development (6)

Total Citations: The pre-AI period (2016-2021) recorded 2,933 citations, while the post-AI period (2022-2026) recorded 4,237 citations. This shows a visible increase in total citations.

Average Citations per Paper: Average citations per paper were calculated using the following formula:
Total number of citations ÷ total number of papers
Pre-AI period: 2,933 ÷ 43 = 68.21
Post-AI period: 4,237 ÷ 381 = 11.12

Number of Authors: The number of authors was collected from the data retrieved from the Scopus database. The pre-AI period includes 98 authors, whereas the post-AI period includes 1,024 authors.

Collaboration Index: The collaboration index was calculated using the following formula:
Total authors ÷ total papers
Pre-AI period: 98 ÷ 43 = 2.28
Post-AI period: 1,024 ÷ 381 = 2.69

Table 1: Percentage Change in Key Bibliometric Indicators between Pre- and Post-2022 Periods

Indicator	Pre-AI Era	Post-AI Era	% Change
Number of Publications	43	381	786.05%
Total Citations	2933	4237	44.45%
Avg Citations per Paper	68.21	11.12	-83.70%
Number of Authors	98	1024	944.90%
Collaboration Index	2.28	2.69	18.00%

Table 1 shows the relative growth and decline across major bibliometric indicators, highlighting the rapid expansion of research output along with changes in citation impact and collaboration patterns. It shows a significant rise in publication output after 2022, with a 786.05% increase in the number of publications and a 944.90% increase in the number of authors. This indicates growing scholarly interest in AI-related work in LIS. The collaboration index increased from 2.28 to 2.69, showing greater interest in co-authorship.

However, although total citations increased, the average citations per paper decreased by 83.70%.

Findings

The results show a notable shift in scholarly research on artificial intelligence (AI) in Library and Information Science (LIS) after 2022. Comparing the pre-2022 period (2016-2021) with the post-2022 period, the number of publications increased by 786.05%. This sharp rise in research output indicates growing interest in AI, especially after the development of generative AI technologies, which accelerated research across several fields, including LIS.

Although publication output increased sharply, total citations increased only moderately, by 44.45%. In addition, the average citation rate per paper decreased significantly by 83.70%, suggesting that recent publications have not yet gained sufficient citation impact. This is largely due to the recency effect, as many post-2022 articles are newly published and have not had enough time to accumulate citations. It also indicates that current AI research in LIS remains in an exploratory and developmental stage.

Another important development is the substantial increase in the number of authors by 944.90%, along with an increase in the collaboration index from 2.28 to 2.69. These developments show a movement toward more collaborative research, which may be linked to the interdisciplinary nature of AI and the involvement of experts from computer science, data science, and library science.

Further analysis of keywords and themes reveals a clear evolution in research direction. In the pre-2022 period, researchers mainly focused on themes such as automation, machine learning, and digital libraries. In the post-2022 period, the dominant themes include advanced concepts such as generative AI, ChatGPT, and AI literacy. This trend shows a shift in research interest from foundational technologies to advanced applications of AI. The emergence of ethics and literacy as themes also indicates the growing social role of AI.

Overall, the findings indicate that AI studies in LIS have made significant progress, with growth in publication output and thematic diversity since 2022. However, the decline in average citation impact per paper suggests that the field is still developing and has not yet reached full maturity. This situation presents both challenges and opportunities for future research.

Conclusion

This paper analyzed the development of AI research within LIS through comparative bibliometrics across two periods: the pre-2022 period (2016-2021) and the post-2022 period (2022-2026). The analysis shows that the emergence and rapid development of AI technologies have had a considerable impact on the direction of research in this area.

The number of publications and authors increased during the post-2022 period, showing growing interest and an expanding research community in AI-related LIS studies. The increase in the collaboration index points to a shift from individual research toward more collaborative work. However, although total citations increased, the decline in average citations per paper reflects the recentness of many publications and shows that the field is still in a developmental stage.

The study also shows a noticeable change in research focus. Recent trends such as generative AI, ChatGPT, and AI literacy have become more prominent, replacing the earlier emphasis on automation and machine learning.

In summary, research on AI in LIS during the post-2022 period shows active development. At the same time, there are significant opportunities for future research to assess both the prospects and challenges of implementing these developments. Future studies may include additional databases, apply more advanced methods of analysis, and adopt a longitudinal research approach.

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