
AI translation · View original & related papers at
chinaxiv.org/items/chinaxiv-201901.00069

Research Status and Knowledge Graph Analysis of Library and Information Science in Belt and Road Countries

Authors: Ma Lili

Date: 2019-01-04T00:00:00+00:00

Abstract

This paper analyzes, from the perspectives of scientometrics and scientific knowledge mapping, the number of research papers, country and regional distribution, research institutions, and research directions in the field of library and information science across 72 countries along the Belt and Road, and the results will serve as a reference for promoting China's Belt and Road Initiative and scientific and technological cooperation with countries along the route in the field of library and information science.

Full Text

Research Status and Knowledge Mapping Analysis of Library and Information Science in Countries Along the “Belt and Road”

(Wuhan Documentation and Information Center, Chinese Academy of Sciences, Wuhan, Hubei 430071)

Abstract

From the perspectives of scientometrics and scientific knowledge mapping, this study analyzes research papers in library and information science (LIS) from 72 countries along the “Belt and Road” initiative, examining publication volumes, geographic and national distributions, research institutions, and research directions. The findings will provide references for promoting China's “Belt and Road” strategy and fostering scientific and technological cooperation in LIS with countries along the route.

Keywords: “Belt and Road” ; Library and Information Science; Countries Along the Route

Introduction

In 2013, during visits to Central and Southeast Asian countries, President Xi Jinping proposed the initiatives of jointly building the “Silk Road Economic Belt” and the “21st Century Maritime Silk Road,” which have garnered widespread international attention. By the time of this study, 72 countries had actively joined the initiative. The “Belt and Road” construction represents not only economic and trade linkages but also roads for cultural and scientific cooperation, with strengthening cultural and technological collaboration among participating countries forming an essential component of China’ s strategy.

As a core discipline in China’ s scientific research system, library and information science can leverage cooperation with libraries and institutions in countries along the “Belt and Road” to fully realize the soft power of cultural advancement strategies, helping overcome institutional and cultural differences and thereby promoting economic cooperation. Regarding scientific and technological cooperation under the “Belt and Road” framework, scholars such as Wu Jiannan, Wang Youfa, and Wang Jimin have examined the overall trends of scientific collaboration between China and these countries from various perspectives. In the LIS domain, Meng Yanli analyzed research status in digital libraries between China and ASEAN countries, Liu Yuanhong discussed exchanges and cooperation between Chinese and Arab libraries, Chen Rumo and colleagues studied Chinese LIS literature on the “Belt and Road” in terms of publication volume, institutions, authors, and keywords, while Zhang Haojue examined library consortia in “Belt and Road” countries, articulating key elements and reference frameworks for constructing new library alliance systems under the initiative.

These studies have investigated “Belt and Road” related literature or specific aspects of LIS; however, no research has yet examined the research status, hotspots, and scientific collaboration patterns across all 72 “Belt and Road” countries in the LIS field. What is the current research landscape in LIS among these 72 countries? How does scientific collaboration manifest in this domain? What are the primary research directions? This paper analyzes publication years, country distributions, collaboration networks, and research themes based on LIS papers from the 72 “Belt and Road” countries, aiming to provide references for cooperation strategies between China and these nations in LIS under the “Belt and Road” framework.

1. Data Sources and Methods

We utilized the Web of Science database’ s SSCI index, selecting papers from 89 journals in the “INFORMATION SCIENCE & LIBRARY SCIENCE” subject category as our data source. The target countries comprised the 72 nations along the “Belt and Road,” with a time span from 1900 to 2017. Data collection was completed on April 17, 2018.

For data cleaning and bibliometric analysis, we employed Thomson Data Analyzer, a bibliometric tool developed by Thomson Reuters. Scientific knowledge

mapping, built upon scientometric theory and combining statistical analysis, social network analysis, and visualization technologies, represents an information technology-based approach to data analysis. This study applied the scientific knowledge mapping tools Ucinet/NetDraw for inter-country collaboration analysis and network visualization, and VOSViewer software for keyword clustering analysis and co-word mapping visualization.

2.1 Publication Year Analysis

A total of 9,078 LIS papers from “Belt and Road” countries were obtained for the period 1904-2017, with annual distributions shown in [Figure 1: see original paper]. The earliest LIS paper from these countries dates to 1904. Between 1904 and 1977, related publications grew slowly, remaining below 10 papers annually. From 1978 to 2000, paper counts showed a gradual upward trend, averaging 58 papers per year. After 2000, publication volume increased rapidly, exhibiting exponential growth with an average annual growth rate of 10.7%. Between 2013 and 2017 alone, 3,822 related papers were published, accounting for 42.1% of the total volume, indicating that LIS research in “Belt and Road” countries has been expanding in recent years.

2.2 Country-Level Analysis

At the time of this study, 66 of the 72 “Belt and Road” countries had published LIS papers indexed in SCI, while Uzbekistan, Laos, Tajikistan, Timor-Leste, Madagascar, and Turkmenistan had no relevant SCI-indexed publications in this field (see). As shown in Table 1, countries with the most LIS publications include South Korea, India, Singapore, South Africa, and Israel. The top 10 countries collectively contributed 6,358 papers, representing 70% of the total output from all 72 countries.

As illustrated in [Figure 2: see original paper], early LIS research emerged primarily in New Zealand, Austria, Russia, Georgia, and South Africa, though most countries along the route began their LIS research mainly after the 1970s. Combining data from Table 1 and Figure 2 reveals that South Korea, India, Singapore, South Africa, and Malaysia have produced substantial numbers of papers in recent five years, while Pakistan, Czech Republic, Romania, Serbia, and Saudi Arabia show high proportions of recent publications. These countries represent key priority partners for China’s LIS cooperation under the “Belt and Road” framework.

In terms of regional distribution, “Belt and Road” countries engaged in LIS research span five continents: 37 Asian countries, 23 European countries, 4 African countries, 1 North American country, and 1 Oceanian country (see). Southeast Asian countries contribute the largest volume of LIS papers, followed by West Asia and Central/Eastern Europe.

2.3 International Collaboration Status

As shown in [Figure 3: see original paper], South Korea, India, New Zealand, Malaysia, South Africa, and Austria exhibit certain centrality in the collaboration network, maintaining prominent cooperation with other countries along the route. Particularly close collaborations exist between South Korea and Singapore, Singapore and New Zealand, and Saudi Arabia and Pakistan. Since many “Belt and Road” countries are developing nations or regions with relatively backward economies and technologies, the scientific and technological resource advantages of developed countries such as the United States become important factors when these nations select cooperation partners. After filtering out collaborative relationships solely among “Belt and Road” countries, [Figure 4: see original paper] displays the collaboration network between these countries and other important non-member states. The United States, United Kingdom, China, Australia, Canada, Germany, and France all play significant roles in the LIS field of “Belt and Road” countries. In terms of LIS research collaboration with China, the primary partner countries along the route are Singapore, South Korea, Malaysia, Hungary, Pakistan, and India.

2.4 Key Research Institutions

Table 3 identifies the top 10 LIS institutions in “Belt and Road” countries as Nanyang Technological University (Singapore), National University of Singapore, University of Malaya (Malaysia), Bar-Ilan University (Israel), Yonsei University (South Korea), University of Pretoria (South Africa), University of Ljubljana (Slovenia), Victoria University of Wellington (New Zealand), Hungarian Academy of Sciences, and Seoul National University (South Korea). Additionally, the top 10 Chinese institutions collaborating with “Belt and Road” countries in LIS are City University of Hong Kong, Hong Kong Polytechnic University, Nanjing University, Fudan University, Peking University, Huazhong University of Science and Technology, Wuhan University, University of Hong Kong, Beihang University, and Dalian University of Technology.

2.5 Research Field Analysis

Co-occurrence analysis and visualization of keywords from “Belt and Road” LIS papers yield the results shown in [Figure 5: see original paper], revealing four major research directions:

First (green cluster): Library management and user services, with key terms including libraries, academic libraries, digital libraries, user studies, public libraries, librarians, bibliographics, and archives.

Second (yellow cluster): Scientometric theory and technology, featuring keywords such as bibliometrics, citation analysis, scientometrics, social network analysis, h-index, research evaluation, indicators, and patent analysis.

Third (red cluster): Knowledge management and big data technology, encompassing knowledge management, knowledge sharing, information technology, ontology, data mining, big data, cloud computing, and semantic web.

Fourth (blue cluster): Social media and mobile information services, including social media, social networks, Twitter, Facebook, web 2.0, Blogs, YouTube, mobile applications, and e-books.

3. Conclusion

The “Belt and Road” initiative represents a major strategic measure for China’s all-around opening-up in the new era and for promoting strengthened cooperation and common development among countries along the route. This analysis of LIS papers from “Belt and Road” countries reveals that since the 1970s, publication volume in this field has shown an overall growth trend, with 66 countries producing relevant papers. South Korea, India, Singapore, South Africa, and Israel have particularly high publication outputs. Extensive collaboration exists among these countries, with developed nations such as the United States, United Kingdom, Canada, and Germany playing important roles. China also maintains substantial cooperation with these countries, which will be further promoted as the “Belt and Road” strategy advances. Thematic analysis indicates that major research areas include library management and user services, scientometric theory and technology, knowledge management and big data technology, and social media and mobile information services. In summary, these findings provide theoretical and data references for advancing the “Belt and Road” strategy and fostering LIS cooperation between China and countries along the route.

References

- [1] Ye Yangping, Ma Wencong, Zhang Guangyu. Research on the Status of Scientific and Technological Cooperation Between China and Countries Along the “Belt and Road”: A Comparative Analysis Based on Patents and Papers[J]. *Library and Information Knowledge*, 2016, 0(4): 60-68.
- [2] Chen Rumo, She Zexin, Meng Xuemei. Visualization Analysis of “Belt and Road” Research Literature in China’s Library, Information, and Archives Field[J]. *University Library Work*, 2017, 37(181): 21-29.
- [3] Wu Jiannan, Yang Ruoyu. Research on the Status of Scientific and Technological Cooperation Between China and “Belt and Road” Countries[J]. *Science of Science and Management of Science and Technology*, 2016, 37(1): 14-20.
- [4] Wang Youfa, Luo Jianqiang, Zhou Xianzhong. Analysis of the Evolution of Scientific and Technological Cooperation Between China and “Belt and Road” Countries in the Past 40 Years[J]. *Science & Technology Progress and Policy*, 2016, 33(24): 1-8.

- [5] Wang Jimin, Wang Ruoqia, Zeng Lanxin, et al. Evolutionary Analysis of the Scientific Collaboration Network of “Belt and Road” Countries from 1996 to 2015[J]. Library and Information Service, 2017, 61(16): 76-83.
- [6] Meng Yanli. Visualization Analysis of Subject Co-occurrence in Digital Libraries Between China and ASEAN Countries Under the “Belt and Road” Environment[J]. Library Work and Study, 2016(11): 50-53.
- [7] Liu Yuanhong. On the Exchange and Cooperation Between Chinese and Arab Libraries Under the “Belt and Road” Development Strategy[J]. Library Research, 2017(1): 1-4.
- [8] Zhang Haojue, Yan Chengxi. ROST-U Construction of a New Library Alliance System for the “Belt and Road” Strategy: A Knowledge Mapping Perspective[J]. Library Tribune, 2018.

Author Information

Name: Ma Lili

Affiliation: Wuhan Documentation and Information Center, Chinese Academy of Sciences; Discipline Intelligence Center

Phone: 13212768860

Email: mall@mail.whlib.ac.cn

Address: No. 25 Xiaohongshan West, Wuchang District, Wuhan, Hubei Province
Postal Code: 430071

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv – Machine translation. Verify with original.