

# The Evolution of Library and Information Science in China under the Big Data Paradigm

—An Empirical Study Based on Chinese Core Literature

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## Abstract

The rapid development of big data technology has had a profound impact on the discipline of information science. This study aims to systematically explore the specific impact of the big data environment on Chinese information science in terms of theoretical system, research methods, research fields, talent cultivation, and interdisciplinary studies. This study focuses on library and information science in the Chinese context, which is traditionally called “information science” in Chinese, but its scope is consistent with the international LIS discipline, covering the collection, organization, analysis and utilization of information, distinct from military intelligence. This study uses bibliometric and content analysis methods to systematically sort out and analyze core high-quality literature related to domestic information science in the past decade (2015-2024). The findings are: 1) The theoretical system is rich under the guidance of national strategy; 2) Literature report research methods are transforming towards “non-interventional”, “holistic” and “computation-driven”; 3) The literature shows that the research field is expanding towards emerging directions such as social media analysis and security intelligence; 4) The literature reflects a greater emphasis on data skills and interdisciplinary knowledge in talent development; 5) The literature confirms the deepening of interdisciplinary integration, with a greater focus on the integration of computer science. This study focuses on the evolution of library and information science in the context of big data in the Chinese context. Given the profound impact of big data on the discipline of Chinese intelligence studies and the relative lack of systematic analysis of the evolution of Chinese intelligence studies in this field in international literature, we choose to conduct in-depth analysis of high-quality literature published in Chinese core academic journals to reveal their

unique transformation paths and driving mechanisms.

## Keywords

Information Science, Big Data, Bibliometric Analysis, Content Analysis

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## 1. Introduction

The rapid development of information technology, especially the rise and application of big data technology, is profoundly reshaping all areas of society. As a discipline that studies the collection, organization, analysis, transmission and utilization of information, the theory, methods and practice of information science have inevitably been strongly impacted by the big data environment and are facing new development opportunities and challenges. In recent years, the academic community has begun to pay attention to the impact of big data on information science (e.g., Ma, Zhang, & Li, 2018). However, existing research has mostly remained at the macro discussion and possibility exploration level, lacking systematic and empirical studies based on large-scale literature evidence, and insufficient exploration of the specific manifestations, extent, mechanisms and typical cases of the impact.

## 2. Research Methods

This study uses bibliometric analysis to objectively depict research trends, hotspots and networks, and combines content analysis to deeply interpret the content of the literature and extract case evidence. It aims to provide a solid and reliable empirical basis for understanding the evolution of information science in the era of big data, reveal the changes in the development of the discipline, and provide scientific references for educational innovation, research layout and practical development of information science.

### 2.1. Bibliometric Analysis

By searching authoritative Chinese databases such as CNKI, Wanfang, VIP, etc., the relevant keywords in the field of information science were identified, and the following keywords were constructed: The search strategy included core keywords such as (“big data” OR “massive data”) AND (“information science” OR “library and information science” OR “information analysis”), with the search time range limited from 2015 to 2024.

### 2.2. Screening Criteria

- 1) Focus on the intersection of big data and information science
- 2) Research papers (excluding reviews/book reviews)

Due to the scarcity of highly relevant academic literature on this topic, after multiple rounds of screening and thorough reading of the full text, 48 highly rel-

evant domestic high-quality journal articles were finally determined as research samples. This study adopted the idea sampling strategy, aiming to systematically capture the core perceptions, key debates and representative practical explorations of the Chinese LIS academic community on the impact of big data. We carefully selected the most relevant research papers from the most influential core journals in the field of library and information science in China, such as *Journal of Information Science*, *Information Theory and Practice*, and *Library and Information Science*. Although the final sample size is 48, these papers represent the cutting-edge thinking, authoritative viewpoints and landmark research results of China's top LIS scholars on this topic, which can effectively reveal the evolution characteristics and driving forces of the discipline in the Chinese context. The small sample size enables us to conduct a detailed and in-depth content analysis of each document, including individual interpretations and cross-validations of theoretical discourse, methodological details, and case evidence, which is often difficult to achieve in large sample quantitative analysis.

### 2.3. Content Analysis

Based on the bibliometric analysis, we further conduct manual reading and content analysis of the selected literature, statistically analyze the content in the literature regarding the theoretical system of information science, research methods, research fields, talent cultivation, and interdisciplinary aspects, and categorize, organize and summarize the relevant information extracted from the reading according to the preset five core dimensions. For example, the content discussing the application of data mining and the transformation of research methods will be classified into the research methods dimension; Categorize the discussion of social media analytics and financial intelligence applications into the research domain dimension. In the process of categorizing and summarizing, identify and document typical research cases and representative author key citations used to support the core viewpoints under each dimension. Manually count the number of references referring to or delving into changes in each core dimension to quantify the level of attention each dimension receives. This method aims to comprehensively and objectively reveal the specific changes and evidence of each dimension of information science in the big data environment through systematic literature review, key information extraction, classification and generalization, and simple quantitative statistics.

## 3. Research Results

### 3.1. Analysis of Bibliometric Results

Annual distribution: Between 2015 and 2024, the number of documents peaked in 2020 at 11, reflecting the increasing academic attention to the topic.

Core journal distribution: *Journal of Information Science* (11 articles), *Information Theory & Practice* (7 articles), and *Library & Information Science* (6 articles) are the main publishing platforms. These journals account for a large pro-

portion of the sample of this study and reflect the research hotspots and trends in the field of information science.

High frequency keywords: The top 10 keywords in terms of frequency are: big data (46 times), information science (38 times), research methods (25 times). The keyword analysis shows that “big data”, “information science” and “research methods” are the core terms in the field.

## 3.2. Results of Content Analysis

### 3.2.1. The Impact of Big Data on the Theoretical System of Information Science

Under the influence of big data, the research objects of information theory have deepened (information->data->intelligence), new theoretical branches have emerged, and the theory of information knowledge representation and organization has been updated. In the context of big data, the theory of information science has been enriched and refined.

#### 1) Inheritance and Development of Information Science Theory

Wang (2019) reviewed the origin and evolution of information science, sorted out the development context of international information science and information science in China, and clarified the essence and characteristics of information science and intelligence work. He focuses on the “changes” and “constants” of information science and information work in the era of big data: The “changes” include the deepening of the object of analysis from “information” to “data”, the return of the object of research from “information” to “intelligence”, the elevation of the processing level from “analysis” to “research”, and the introduction of theories and methods of related disciplines; The unchanging part includes the unchanging requirements and standards of “broad, fast, precise and accurate”, the unchanging role status of “Eyes and ears, top soldiers, staff officers”, the unchanging functional positioning of decision support and the unchanging functional positioning of strategic planning. The conclusion is: the historical mission, fundamental task, research or work object, discipline or work boundary of information science and information work remain unchanged, only the content, methods, tools, techniques, mechanisms and models of research or work have changed. Wang (2021) analyzed the opportunities and challenges that information science faces in the era of big data and explored how to inherit and develop the academic tradition of information science. Based on a review of the history of information science, this paper analyzes the situation of information science in the era of big data and proposes “four inheritances” and “five developments”. The author argues that there is no development without inheritance and no innovation without reference. This is crucial for information science.

#### 2) Innovation and Expansion of Information Science Theory

Ma, Zhang, & Li (2018) pointed out that big data has led to changes in the research objects and methods of information science theory, giving rise to new theoretical branches such as big data information theory, providing a new perspective

for the innovative development of information science theory. [Li & Yang \(2019\)](#), guided by big data thinking, proposed new theories and methods for the development of information science, emphasized the deep integration of information science theory with big data technology, and promoted the improvement and innovation of the information science theory system. [Hu & Lü \(2020\)](#) explored the new developments of information science theory in the context of big data and intelligent environment, including the innovation of theories such as information knowledge representation and information knowledge organization, as well as the expansion and application of information science theory in the intelligent environment.

### 3.2.2. The Transformation of Information Science Research Methods in the Context of Big Data

Big data environment drives three major trends in information science research methods: 1) Non-interventional (such as passive analysis using web traces, which has also sparked widespread discussions about user privacy protection, ethical boundaries of data access, etc.), 2) holistic (full sample, large-scale analysis replacing sampling), and 3) computationally driven (data mining, machine learning, text analysis, visualization becoming mainstream tools). The application scenarios of traditional methods (such as questionnaires) have narrowed, and new methods such as causal inference (such as propensity score matching) have been introduced ([Wang, Zhao, & Wang, 2020](#)).

#### 1) Application of Data Mining and Analysis Methods

[Sun \(2015\)](#) combined information science methods with big data analysis and applied them to the field of technology prediction, and explored the specific application of data mining, machine learning and other methods in information science, which improved the scientificity and accuracy of information science research. [Zhao, Dong, Ma et al. \(2015\)](#) analyzed the transformation of the research paradigm of information science in the era of big data, emphasized the importance of data mining and analysis methods in information science research, and provided theoretical support for the innovation of information science research methods. [Tang, Jiang, Xu et al. \(2020\)](#) delved into the application of data mining and analysis methods in the context of big data, including techniques such as text mining and data visualization, and constructed a system of methods and techniques in information science, providing new means and tools for information science research.

#### 2) Synthesis and Innovation of Research Methods

[Wang, Zhao, & Wang \(2020\)](#) introduced the propensity score matching method, providing a new approach and idea for causal inference in information science research and promoting the integration and innovation of information science research methods. [Ding, Li, & Hu \(2021\)](#) pointed out that the rapid development of advanced information technologies such as big data, artificial intelligence and blockchain has driven significant changes in the content and methods of information science research. The changes in the content of information science re-

search include: changes in the study of concept chains and knowledge, the emergence or urgent need to construct new sub-disciplines, and greater emphasis on the study of advanced information technology; The changes in information science research methods include: the evolution of information science research methods in the big data environment, different analytical tools and methods from the past, and the gradual improvement of the scientific research methodology system. Zhang, Li, Ding et al. (2021) compared and analyzed the differences and connections between information science and data science, combining extensive literature collation and theoretical analysis. Focusing on the two perspectives of disciplinary research methods and disciplinary educational content, the analysis of data science in multiple aspects such as the repositioning of educational goals in information science, the redesign of educational content, and the new requirements for talent cultivation can provide useful reform direction references for the development of modern information science disciplines, not only helping to change some outdated contents and methods inherent in traditional information science disciplines, It also helps information science to better adapt to the various practical demands of the new era, including at the national strategic level and the social application level.

### **3.2.3. The Expansion of the Field of Information Science Driven by Big Data**

Emerging fields such as social media analytics, online public opinion monitoring, health informatics, financial intelligence, security intelligence, and cognitive intelligence have emerged; Traditional fields (such as intelligence processes and knowledge organization) are deepening (such as optimizing intelligence collection and analysis links) and expanding into new dimensions (such as introducing blockchain technology) in the context of big data. The big data environment also broadens the field of information science research.

#### 1) The Rise of Emerging Fields

Pang (2018) proposed the concept of cognitive intelligence science, explored the new opportunities and challenges of intelligence analysis in the cognitive field in the context of big data, and opened up new space for the field of information science research. Xia (2022) combined text big data with information science to explore a new field of visual teaching of disciplinary knowledge, providing new ideas and methods for information science education and research. Li & He (2022) studied the application of information science in the financial field under the big data environment, analyzed the security and risk issues of financial innovation, and expanded the new direction of information science research in the financial field.

#### 2) Deepening and Expansion of Traditional Fields

Chen, Jiang, & Ge (2020) conducted in-depth research on intelligence processes in the context of big data, analyzed the changes and optimizations in the links of intelligence collection, organization and analysis, and deepened the research of intelligence science in traditional fields. Wang & Wu (2020) studied the transformation and development of security intelligence in the context of big data, ex-

explored the new applications and challenges of intelligence in the field of security, and expanded the depth and breadth of intelligence research in the field of security. [Su, Lü, & Zhao \(2024\)](#) introduced blockchain technology into the field of information science, studied the application and impact of blockchain in information science, and expanded new dimensions for research in the traditional field of information science.

### 3.2.4. Transformation of Talent Cultivation in Information Science in the Context of Big Data

The training objectives place greater emphasis on data analysis skills, technical application skills (programming, tool usage), practical (project) experience, and interdisciplinary knowledge (computer science, statistics, domain knowledge); Curriculum reform (adding courses in data science, programming, and data analysis); Teaching mode innovation (project-driven, case-based teaching); Emphasis on cross-disciplinary thinking and versatile talents (e.g., [Zhao, Qiao, & Ye, 2020](#)).

#### 1) Reform and Innovation of Information Science Education

[Xiao \(2022\)](#) explored the construction of the curriculum system for library and information science in the era of big data, and put forward suggestions such as optimizing the curriculum setting and strengthening practical teaching, providing a reference for the educational reform of information science. [Liu & Ma \(2023\)](#) based on historical review and literature analysis, sorted out the situation in aspects such as professional adjustment, teaching resources, technology expansion, talent cultivation, curriculum design and integrated innovation of information science education in the context of digital intelligence evolution, and put forward several thoughts based on the characteristics of digital intelligence and the development of information science education. It also proposed a macro path for the innovative development of information science education in China empowered by digital intelligence in combination with the current level and practical thinking, hoping to reposition the core competencies that information science education needs to cultivate and the mission responsibilities that need to be implemented urgently. [Liu, Wang, Shen et al. \(2020\)](#) reviewed the development process of information science education in the era of big data, looked forward to the future development trend of information science education, and emphasized the importance of information science education in cultivating talents adapted to the big data environment.

#### 2) Innovation and Practice of the Talent Cultivation Model

[An, Yi, Chen et al. \(2016\)](#) introduced the development and transformation of information science education in the Asia-Pacific region under the background of big data, including the innovation and practice of talent cultivation models, providing international experience and reference for information science talent cultivation. [Li & Luo \(2020\)](#) proposed a knowledge integration model for information science education in the context of big data, emphasizing the integration and application of interdisciplinary knowledge, providing theoretical support for the innovation of information science education models. [Zhao, Qiao, & Ye \(2020\)](#) explored a new model of cross-border expansion in information science, providing

a new perspective and approach for the innovation of the talent cultivation model in information science, and cultivating compound talents with cross-border thinking and innovation ability.

### **3.2.5. Big Data Promotes the Interdisciplinary Integration of Information Science**

Under the influence of the big data environment, the integration of information science with computer science (data science, artificial intelligence, blockchain) is most significant and deep; There is an increase in cross-disciplinary collaboration with management (strategic decision-making, risk management), sociology (social network analysis), medicine (health informatics), finance (financial intelligence), etc. Interdisciplinary research teams have become the norm.

#### 1) Integration of Information Science and Computer Science

[Ba, Li, & Zhou \(2018\)](#) studied the impact of data science on the transformation of information science, analyzed the cooperation and integration of information science and computer science in data processing, analysis, etc., and promoted the development of interdisciplinary integration of information science. [Nie & Wang \(2018\)](#) analyzed the relationship between information science and data from the perspective of data science, explored the cross-integration of information science and computer science in the field of data science, and provided new ideas and directions for the development of the discipline of information science. [Ding \(2021\)](#) from the perspective of information communication theory, explores the development trend of the integration of information science and computer science in the era of artificial intelligence, providing new theories and methods for the interdisciplinary integration of information science.

#### 2) Interdisciplinary Cooperation of Information Science with Other Disciplines

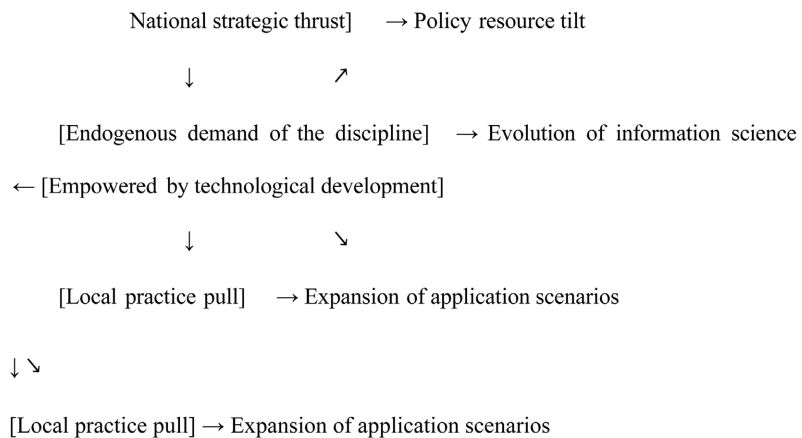
[Luo & Li \(2021\)](#) summarized ten characteristics of the development of information science in the big data environment, including the cross-integration characteristics of information science with other disciplines, providing a theoretical basis and practical guidance for interdisciplinary cooperation in information science. [Wang et al. \(2021\)](#) reviewed the development context of information science in the era of big data, emphasized the important role of cross-disciplinary cooperation of information science with other disciplines in promoting the development of information science, and provided historical experience and future development direction for the cross-disciplinary integration of information science. [Su \(2022\)](#) studied the cross-disciplinary cooperation between information science and other disciplines in the context of big data and new liberal arts, proposed new models and methods for the cross-disciplinary integration of information science, and injected new vitality into the development of the discipline of information science.

## **4. Discussion**

### **4.1. Core Discovery and Driving Mechanism (Figure 1)**

1) The profound shaping of the national security strategy: Research has found

that the theoretical development of information science, emerging research fields, and the goal of talent cultivation (such as the “Eyes and ears, top soldiers, staff officers”) are all significantly driven by the top-level design and resource inclination of the “overall national security view”. This reflects the attribute of disciplines serving the national strategic needs.



**Figure 1.** Five forces drive model.

2) Strong traction of national education policies: The transformation of talent cultivation models (such as Xiao’s (2022) discussion on curriculum reform) and the deepening of interdisciplinary integration (such as Su’s (2022) research in the context of new liberal arts) have actively responded to national higher education policy orientation such as “New liberal arts” and “Double First-Class”, providing institutional guarantees and development impetus for discipline construction.

3) Direct pull from the demand for local practice: The rapid rise of fields such as social media analysis and online public opinion monitoring is a direct response to the current demand for large-scale and highly complex local practice such as refined social governance and security prevention of fintech. The large base of Internet users, the active social media ecosystem and the construction of smart cities provide rich application scenarios and data foundations for information science research.

4) The combined effect of technology empowerment and intra-disciplinary drive: The rapid development of technologies such as big data, cloud computing, and artificial intelligence provides strong tool support (technology empowerment) for the “computing-driven” transformation of information science research methods (such as data mining and machine learning applications). At the same time, the academic community of information science itself seeks to enhance the discipline’s influence, expand its research territory, and better serve national strategies and social development (endogenous dynamics of the discipline), which jointly drive the overall evolution of the discipline.

## 4.2. Theoretical Contributions and Practical Implications

Theoretical contributions: For the first time depicted the transformation path of

information science based on a literature system, enriched the case study of the discipline's adaptation to big data, and revealed the interaction mechanism of policy-technology-discipline.

Practical insights:

1) In the field of education: Provide empirical evidence for the curriculum reform of information science institutions (strengthening data science, practical courses) and the innovation of training models (knowledge integration).

2) Research areas: Identify frontier directions such as AI-driven analytics and health informatics, emphasizing computationally driven and interdisciplinary approaches.

3) Intelligence practice: Demonstrate the application potential of new theories and technologies in Chinese scenarios such as public opinion monitoring and financial risk control.

### 4.3. Limitations and Future Directions

Limitations: The analysis relies on published literature and lacks practical cases; There is a risk of subjective judgment in content analysis. The main limitation of this study is that the sample mainly comes from core Chinese journals and does not cover international literature or broader Chinese literature sources (such as conference papers, dissertations). This is mainly due to two factors: 1) The number of high-quality core literature in the cross-study of big data and Chinese LIS is limited; 2) The research aims to deeply focus on the cognition and practice of China's top scholar group, and core journals are the main carriers of its results.

Nevertheless, this study is the first to systematically sort out and empirically depict the overall picture and core driving logic of the evolution of the LIS discipline in China under the big data environment, providing an indispensable baseline reference and conceptual framework for subsequent comparative studies, policy-making and educational reform.

Future directions: In-depth research in areas such as health informatics and blockchain intelligence applications; Explore the ethical and privacy challenges of big data intelligence; Evaluate the effectiveness of the talent development model; Conduct a comparative study of the evolution of information science in China and abroad. The results of this study provide a basis and direction for further in-depth exploration of the development of information science in the context of big data, and subsequent research can continue to expand and deepen on this basis to enhance the guidance for future research directions. In particular, the revolutionary impact of cutting-edge technologies such as generative artificial intelligence on intelligence analysis paradigms, knowledge representation and creation awaits further observation and research.

Future research can be expanded in the following ways:

1) Incorporate an international comparative perspective: Compare the evolution path of Chinese information science revealed in this study with regions such as Europe and the United States to explore the commonalities and regional char-

acteristics of the discipline's development under the impact of technology;

2) Expand the sources of literature: Incorporate high-quality conference papers, monograph chapters and policy documents to build a more comprehensive picture;

3) Combined with interviews/surveys of practitioners: Make up for the deficiency of pure literature analysis in capturing the details of practical implementation.

## 5. Conclusion

This study empirically reveals the profound impact of the big data environment on the evolution of the discipline of information science in China through a systematic analysis of high-quality domestic literature in the past decade (2015-2024). The core findings suggest that Information science is in five dimensions: theoretical system (such as deepening of research subjects and emergence of new branches), research methods (shifting towards non-interventional, holistic, and computationally driven), research fields (expanding in emerging directions such as social media analytics and security intelligence), talent cultivation (emphasizing data skills, practical experience, and interdisciplinary knowledge), and interdisciplinary integration (especially with computer science) significant changes have taken place. These changes did not occur in isolation but as a systematic evolution driven by a combination of national strategic push, policy and institutional pull, local practice pull, technological development empowerment, and endogenous disciplinary demands.

This study not only systematically depicts the specific path of the transformation of information science in the big data environment and enriches the case evidence of the discipline's adaptation to technological changes, but also reveals the complex driving mechanism of the interaction between policy, technology, practice and discipline, providing a new perspective for understanding the positioning and development of information science in the data age. The research results have clear implications for the reform of the information science education system (strengthening data science, practice and integration), the layout of research frontiers (focusing on AI-driven analysis, health informatics, etc.) and the innovation of information practice (applied to local scenarios such as public opinion monitoring and financial risk control). The research shows that the evolution of information science in China is not only driven by technology, but also deeply embedded in the national development strategy and the modernization process of social governance, forming a "technology-policy-practice" synergistic driving model.

Future research could further explore emerging fields such as health informatics and blockchain intelligence applications, systematically address ethical and privacy challenges in big data intelligence practice, empirically evaluate the effectiveness of new talent cultivation models, and conduct cross-national and cross-regional comparative studies to continuously deepen the understanding of the laws governing the development of information science in the big data environ-

ment and promote sustainable innovation in the discipline.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- An, L., Yi, X. J., Chen, S. Y. et al. (2016). The Development and Transformation of Library and Information Science Education in the Asia-Pacific Region under the Background of Big Data. *Library and Information Science Knowledge*, 1, 122-128.
- Ba, Z. C., Li, G. J., & Zhou, L. (2018). Data Science and Its Impact on the Transformation of Information Science. *Journal of the Chinese Society for Information Science*, 37, 653-667.
- Chen, Z. Q., Jiang, X., & Ge, J. (2020). Research on Intelligence Process in Big Data Environment. *Intelligence Theory and Practice*, 43, 46-53.
- Ding, B. T. (2021). The Development and Innovation of Information Science in the era of Artificial Intelligence: from the Perspective of Information Exchange Theory. *Journal of the Chinese Society for Information Science*, 40, 321-332.
- Ding, X. W., Li, S. Y., & Hu, H. (2021). Changes and Reflections on the Content and Methods of Information Science Research Driven by Advanced Information Technology. *Library and Information*, No. 5, 123-127.
- Hu, C. P., & Lü, M. (2020). The Development of Information Science Theory in the Data and Intelligence Environment. *Information Theory and Practice*, 43, 1-6.
- Li, G. J., & Luo, L. Q. (2020). Towards Knowledge Integration: The Development Trend of Information Science under the Big Data Environment. *Journal of Library Science in China*, 46, 26-40.
- Li, M. C., & He, X. (2022). Financial Innovation Security and Risk Analysis Based on Big Data in the Field of Information Science. *Information Science*, 40, 53-57, 87.
- Li, P., & Yang, J. (2019). Exploration of the Development Path of Library and Information Science Based on Big Data Thinking. *Journal of the China Society for Information Science*, 38, 239-248.
- Liu, L., Wang, D., Shen, S. et al. (2020). Review and Prospect of Information Science Education in the Era of Big Data. *Journal of the Chinese Society for Information Science*, 39, 1264-1271.
- Liu, X. R., & Ma, H. (2023). Research on the Macro-Path of China's Information Science Education Reform in the Era of Digital Intelligence Empowerment. *Library theory and Practice*, No. 4, 72-80.
- Luo, L. Q., & Li, G. J. (2021). Ten Characteristics of the Development of Information Science under the Big Data Environment. *Library and Information*, No. 1, 77-87.
- Ma, F. C., Zhang, R., & Li, Z. (2018). The Impact of Big Data on Information Science Research. *Library and Information Knowledge*, No. 5, 4-9.
- Nie, L., & Wang, J. (2018). The Relationship between Information Science and Data from the Perspective of Data Science. *Library and Information Knowledge*, No. 6, 29-36, 74.
- Pang, N. (2018). Cognitive Intelligence: New Opportunities for Intelligence Analysis in the Context of Big Data. *Intelligence Theory and Practice*, 41, 55-60, 98.
- Su, X. N. (2022). Research on Library and Information Science under the Background of Big Data and New Liberal Arts. *Journal of Southwest University for Nationalities (Humanities and Social Sciences Edition)*, 43, 224-228.

- Su, Z., Lü, J., & Zhao, W. (2024). Research on Blockchain in Intelligence Science and Intelligence Work in the Era of Big Data. *Information Science*, 42, 28-33.
- Sun, Q. L. (2015). Research on the Application of Information Science Methods in Technology Forecasting under Big Data Environment. *Information Science*, 33, 106-111.
- Tang, M. W., Jiang, X., Xu, Z. et al. (2020). Construction of Information Science Methods and Technical Systems under Big Data Environment. *Information Science*, 38, 106-111.
- Wang, B., & Wu, C. (2020). The Transformation and Development of Security Intelligence under the Big Data Environment. *Library and Information Work*, 64, 12-18.
- Wang, F. S. et al. (2021). A Review of the Development of Intelligence Science in the era of Big Data. *Intelligence Magazine*, No. 5, 1-7.
- Wang, X. L., Zhao, Y., & Wang, Y. (2020). Propensity Score Matching Method: Promoting Causal Inference in Information Science Research from the Perspective of Data Science. *Journal of the China Society for Information Science*, 39, 1191-1203.
- Wang, Z. J. (2019). The “Changes” and “Unchanges” of Intelligence Science and Intelligence Work in the Data Era. *Intelligence Theory and Practice*, 42, 1-10.
- Wang, Z. J. (2021). The Inheritance and Development of Information Science under the Big Data Environment. *Library and Information Work*, 65, 3-12.
- Xia, Y. X. (2022). Exploration and Practice of Visual Teaching of Subject Knowledge Based on Text Big Data: Taking Information Science as an Example. *Modern Information Science*, 42, 104-116.
- Xiao, P. X. (2022). Research on the Construction of Library and Information Science Curriculum System in the Era of Big Data: Review of “Research on the Theoretical Development and Innovative Practice of Modern Library and Information Science”. *Chinese Journal of Education*, No. 2, 146.
- Zhang, H., Li, S. Y., Ding, X. W. et al. (2021). Research Methods and Educational Content Design of Information Science for Data Science. *Library and Information Science*, No. 5, 115-122.
- Zhao, X., Qiao, L., & Ye, Y. (2020). Cross-Border Expansion of Library and Information Science towards Data Intelligence and Knowledge Discovery: Data-Academic-Creative Integration Theory. *Journal of Library Science in China*, 46, 16-25.
- Zhao, Y. L., Dong, H., Ma, L. et al. (2015). The Paradigm Shift of Information-Centered Library and Information Science Research in the Era of Big Data. *Information Magazine*, 34, 46-49, 118.