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## Policy Text Analysis and Evolutionary Pattern Research on China's Document Information Resource Assurance System (Postprint)

**Authors:** Ye Guanghui, Xia Yanyan, Li Ziqi

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### Abstract

[Purpose/Significance] This study reviews the evolution trajectory, current development status, and challenges of China's literature and information resource guarantee system, aiming to provide recommendations for its improvement and further development. [Method/Process] Based on 91 policy documents concerning China's literature and information resource guarantee, this research first employs bibliometric methods to analyze the temporal evolution of policy issuance and the cooperation networks of implementing institutions; second, utilizes content analysis to encode policy texts and examine evolutionary trends from the literature and information value chain perspective; and finally, applies case analysis to verify the system's evolution patterns through the construction processes of CALIS, CASHL, and NSTL. [Results/Conclusion] The development of China's literature and information resource guarantee system exhibits both external evolutionary characteristics—namely, the phasing of implementation processes and the collaborative nature of implementing institutions—and internal evolutionary characteristics, specifically the richness of work content.

### Full Text

#### Research on Policy Text Analysis and Evolution Patterns of China's Document Information Resource Guarantee System

**Ye Guanghui, Xia Yanyan, Li Ziqi** School of Information Management, Central China Normal University, Wuhan 430079

**Abstract:** *[Purpose/Significance]* This study examines the evolutionary process, current development status, and challenges facing China's document information resource guarantee system to provide recommendations for its improvement and future development. *[Method/Process]* Using 91 policy documents

related to China's document information resource guarantee system as research objects, we first employ bibliometric methods to analyze the temporal evolution of policy publication numbers and the cooperation networks of implementing agencies. We then use content analysis to encode policy content and examine evolution trends from the perspective of the document information value chain. Finally, we apply case analysis to verify these evolution patterns through the development processes of CALIS, CASHL, and NSTL. *[Results/Conclusions]* The development of China's document information resource guarantee system exhibits both external evolution characteristics—namely, the staged nature of implementation processes and collaborative nature of executive agencies—and internal evolution characteristics reflected in the richness of work content.

**Keywords:** document information resource; guarantee system; policy text; evolution pattern; document delivery service system

The level of document information resource guarantee serves as a crucial indicator for measuring a nation's accumulation and utilization capacity of such resources. A document information resource guarantee system represents an integrated system capable of effectively meeting societal documentation needs within a certain scope. However, China has long faced challenges of imbalance and insufficiency in document information resource guarantee, with its construction failing to align with national development strategies at different stages. On one hand, resource development has not kept pace with national progress, relying primarily on past experiences rather than effectively integrating future development needs, resulting in inadequate development of disciplinary services and think tank services. On the other hand, the construction model has remained relatively closed, with mismatches between production, publication, and consumption of document information resources. Against this backdrop, relevant authorities continuously adjust policies to align resource development with societal needs across various domains.

By analyzing the developmental trajectories of the China Academic Library & Information System (CALIS), the China Academic Social Sciences and Humanities Library (CASHL), and the National Science and Technology Library (NSTL) from the perspective of policy implementation effectiveness, this study clarifies the evolution patterns of China's document information resource guarantee system over time, thereby promoting its further development.

## Literature Review

This section reviews relevant literature on document information resource guarantee system policies and policy evolution patterns, discusses the necessity of analyzing China's system evolution through policy texts, and constructs an analytical framework.

## 2.1 Policy-Related Research on Document Information Resource Guarantee Systems

For document information resource guarantee systems, policy issuance often determines development direction. National and higher-level departments regulate system construction through policies covering resource allocation, demand guarantee, document retrieval, digital services, and network infrastructure, thereby promoting coordinated resource development. Libraries play an indispensable role in storing, organizing, and providing access to both print and electronic resources. As vital components of China's guarantee system, library policies reflect its development trajectory. Early library policies primarily referred to normative guidelines formulated by state organs and library professional organizations to regulate library operations and development. As China's legal system gradually improved and the era progressed, library policy scope expanded to include relevant laws, regulations, rules, institutional frameworks, national development plans, and directives from authoritative departments or individuals.

Existing research on document information resource guarantee policies generally approaches from the perspective of ensuring resource construction and services, treating policies, laws, and institutions as necessary conditions for resource guarantee. Scholars have proposed enhancing legal awareness and establishing effective supervision systems, using policies and regulations to standardize and promote resource construction, and clarifying responsibilities and obligations of management departments and institutions. Some have also suggested providing policy support for intellectual property protection and cybersecurity.

## 2.2 Research on Policy Evolution Patterns

Research methods for analyzing policy evolution patterns can be categorized into three main types: (1) Content analysis, which provides objective and systematic quantitative analysis of textual materials. Some scholars have extracted high-frequency keywords from policy documents across time dimensions to identify major challenges faced by different sectors. (2) Bibliometrics, which applies traditional bibliometric methods to policy texts. Researchers have quantitatively analyzed China's data openness policy system from administrative levels, external structures, and policy instruments. (3) Social network analysis, which emphasizes relationship networks implicit in policy texts from a macro perspective, highlighting interaction patterns between policies and literature.

Policy texts possess authority, seriousness, and binding force unmatched by journal articles or patent literature. Both bibliometrics and content analysis support large-scale text analysis, enabling extraction of new perspectives from historical data sources to understand actual event scopes and validate other methods, thereby revealing essential factual patterns and evolution trends.

## 2.3 Research Review and Design

Current research on China's document information resource guarantee system policies and their evolution remains limited. Policy texts constitute a special document type, and analyzing their evolution patterns can reflect development priorities across different periods. This study examines relevant policies to deeply understand the system's evolution, current status, and challenges, combining analysis of CALIS, CASHL, and NSTL to provide recommendations for future development.

Based on the literature review, this study designs the following research approach: First, use bibliometrics to convert policy texts into quantitative data, analyzing external characteristics to identify different implementation periods and examine evolution of executive agencies. Second, apply content analysis to encode policy texts, extracting different dimensions to analyze internal evolution processes. Finally, use case analysis to verify evolution patterns through the development of CALIS, CASHL, and NSTL, identifying achievements, problems, and future needs. The resulting analytical framework is shown in Figure 1 [Figure 1: see original paper].

## Evolution Pattern Analysis Based on Policy Texts

This study examines policies related to China's document information resource guarantee system from 1989-2020, sourced from the Peking University Law Database. This comprehensive and authoritative database contains all laws and regulations since 1949. Using keywords including "document information resource guarantee," "document information guarantee," "document resource guarantee," and "document guarantee," we retrieved 136 documents as of October 21, 2020. After screening for relevance, formal policy documents, and validity, 91 policy texts were selected for analysis.

### 3.1 External Characteristics Analysis

Analyzing temporal distribution and implementing agencies helps grasp macro-level evolution of the guarantee system.

**3.1.1 Policy Quantity Evolution Analysis** Dividing the 91 policy texts into 5-year intervals reveals the distribution from 1989-2020 (Figure 2 [Figure 2: see original paper]). Overall, policy numbers show an initial rise followed by decline, matching a lifecycle pattern. From 1989-2003, limited reference policies and researchers resulted in few texts with slow growth, marking the system's formation period. During 2004-2008, increasing policies and professionals accelerated growth, indicating a development period. From 2009-2013, the system entered maturity—policy numbers continued increasing but growth rates slowed. During 2014-2020, despite abundant relevant policies, researchers shifting to other fields slowed growth, showing decline. Based on these characteristics, we

divide the system's implementation into four stages: formation (1989-2003), development (2004-2008), maturity (2009-2013), and stability (2014-2020).

**3.1.2 Executive Agency Cooperation Network Analysis** Policy actors cooperate to achieve goals, forming network structures. Using Gephi 0.9.2, we mapped cooperation networks across different stages (Figure 3 [Figure 3: see original paper]). Leading organizations evolved with policy priorities. During formation, State Council ministries led with loose cooperation and low participation, concentrating management at the national level. In development, universities became primary guarantee entities, making education departments the lead actors with closer inter-departmental ties and increased participation. Management focus shifted downward, enabling nationwide distributed construction. During maturity, improved organizational management required increased funding to consolidate achievements, with finance departments becoming core leaders while education departments continued cooperating with universities to expand resource sharing. The stability stage aimed to ensure smooth policy implementation, with strengthened inter-agency cooperation and a policy focus shifting toward rights protection, as intellectual property offices worked with social organizations to protect intellectual creations through legal means.

### 3.2 Internal Evolution Analysis

Content analysis reveals internal evolution processes and overall development patterns.

**3.2.1 Policy Text Content Encoding** We selected policy text sentences related to document information resource guarantee as analysis units, decomposing 91 valid samples into 367 units for coding. Building on the information resource lifecycle perspective, we constructed a document information value chain comprising four categories: collection, organization, allocation, and service. This yielded 40 subcategories (Table 1).

**3.2.2 Policy Text Content Evolution Analysis** We analyzed evolution across the four stages for each value chain component (Figure 4 [Figure 4: see original paper]), where node sizes indicate frequency and importance, and connections show relationships and innovations.

**Document Collection Evolution:** Collection includes production/procurement, management systems, and information industry chain. Collection scope evolved from print to electronic then digital resources. During formation, increasing talent demands spurred construction of research institutions and universities. Management systems coordinated collection efforts to address limited collection methods. The development period expanded collection types due to growing demands. Maturity saw increased copyright awareness, making licensed purchases a research focus for property protection. The stability period formed complete information transmission networks.

**Document Organization Evolution:** Organization focused on database construction, maintenance, and cataloging. During formation, abstract databases dominated, with standardization proceeding alongside construction through union catalogs and unified publishing formats. Development saw evolution to full-text databases, with international cooperation promoting research levels and introducing foreign databases and patent databases. Maturity built special collections to meet diverse needs, emphasizing maintenance through network construction and equipment updates. Stability maintained databases through regular consistency checks and improved internal data maintenance by separating public and reader catalogs, achieving integrated data protection.

**Document Allocation Evolution:** Allocation aimed for rational, balanced distribution through mechanisms and scope. Formation concentrated resources in universities and research centers, requiring document delivery networks. Development expanded scope and international exchanges, linking university and public library resources with market demands. Maturity promoted cross-strait cooperation and built regional collections for quality resource exchange. The stability period established complementary mechanisms to improve resource flow efficiency.

**Document Service Evolution:** Resource sharing services form the core, alongside management systems and intellectual property. Public service systems prioritized user needs, providing reference consultation, interlibrary loan, and information services during formation, with established sharing mechanisms and service standards. Development added performance assessments and specialized services. Maturity introduced services for special groups. Stability focused on developing intellectual property service industries, using legal measures to protect resource ownership.

## Development Trend Analysis: CALIS, CASHL, and NSTL as Cases

Representative national guarantee systems include CALIS, CASHL, and NSTL. CALIS aims to build a distributed interlibrary loan service system; CASHL provides humanities and social sciences document delivery; NSTL offers science and technology literature information resources through a network-based system. Their evolution reflects systematic and deepening development, verifying our value chain analysis.

### 4.1 Evolution Analysis of the Three Systems

The three systems' development aligns with policy stages, with service expansion reflecting improving development levels. CALIS underwent three "211 Project" investment phases from 1998 before entering operation and innovation development in 2013. CASHL began humanities and social sciences journal services in 2004, launching "Special Collection ++" deep services in 2015 and lecture series in 2017. NSTL has provided nationwide science and technology litera-

ture services since 2000, establishing the National Digital Preservation Program (NDPP) in 2013 and Scientific and Technological Knowledge Organization Systems (STKOS) in 2015, while launching special services including key field information portals and national strategic information platforms.

**External Characteristics:** As service scope expanded, policy implementation agencies strengthened cooperation and management focus shifted downward. CALIS evolved from a “national-regional-university” three-tier model to “national-provincial/member” structure, adding 15 provincial centers. CASHL similarly built a three-tier system, expanding nationwide for distributed collection. NSTL, supported by seven ministerial institutions and two co-construction units, built 8 mirror sites and 40 service stations. Strengthening cooperation among these systems with complementary advantages can better meet diverse user needs.

**Internal Evolution:** Table 2 compares achievements across development stages. For collection, all three systems adopted group purchasing, with CALIS and NSTL pioneering this model and CASHL establishing coordinated procurement mechanisms. Post-maturity, electronic resource procurement became central, with CALIS using cloud computing to improve procurement platforms while CASHL and NSTL focused on filling collection gaps. For organization, CALIS and CASHL evolved from abstract to full-text databases, while NSTL emphasized retrospective databases. All built union catalogs, with CALIS developing standard systems and name authority databases, CASHL providing deep collection revelation, and NSTL establishing metadata specifications and long-term preservation mechanisms. For allocation, CALIS built distributed delivery networks, while CASHL and NSTL used centralized models. Maturity brought cross-border cooperation and international alliances. For services, all implemented sharing principles, with CALIS building nationwide library cooperation networks and cloud platforms, CASHL diversifying retrieval services, and NSTL developing knowledge organization systems.

## 4.2 Future Development Recommendations

To build a digital-era guarantee system, future development should address:

**Document Collection:** Continue coordinating print, digital, and other format acquisitions. Optimize management systems to avoid duplicate purchasing while strengthening joint procurement planning. Collaborate with publishers to shorten acquisition timelines and improve digital resource evaluation and long-term protection mechanisms.

**Document Organization:** Improve database construction for stability and security. Strengthen inter-departmental coordination through regulations and use big data technology for deep resource revelation and knowledge organization. Enhance network infrastructure and equipment update protocols for integrated data protection.

**Document Allocation:** Despite initial rational distribution, long-term regional imbalances require increased support for western, impoverished, and ethnic minority areas. Clarify government-market divisions to improve resource flow efficiency and establish institutional arrangements combining government guidance with market determinism.

**Document Services:** As digital library implementation expands, personalized knowledge services become central. Establish user feedback mechanisms and apply emerging technologies to improve experiences. Use cloud computing for intellectual property protection through access control, improve service management systems, and strengthen librarian training to shift from passive to active services.

## Conclusion

This study analyzed policy text evolution using bibliometrics and content analysis, verified through case studies of CALIS, CASHL, and NSTL. Two key findings emerge: First, external evolution shows staged implementation processes and agency collaboration, with development matching lifecycle patterns and different agencies assuming appropriate responsibilities. Second, internal evolution demonstrates rich work content across collection, organization, allocation, and service components, each with distinct patterns. Based on the document information value chain, this research reveals evolution patterns and provides recommendations for future development. Future research could examine policy instruments to address existing problems and further explore implementation conditions.

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**Author Contributions:** Ye Guanghui: Conceptualization, methodology, revision; Xia Yanyan: Framework design, data collection, writing; Li Ziqi: Framework design, revision.

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

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