Postprint: Construction of Collaborative Innovation and Safeguard Mechanisms between Library and Information Institutions and Think Tanks from a Cooperative Alliance Perspective

Authors: Zheng Rong, Wang Jie, Yang Ran

Date: 2023-08-27T00:00:00+00:00

Abstract

[目的/意义] Establish collaborative innovation mechanisms and safeguard mechanisms between library and information institutions and think tanks to achieve resource integration and collaborative development. [方法/过程] This study employs literature review and case analysis methods to elaborate on the feasibility, necessity, and value significance of collaborative innovation between library and information institutions and think tanks. Based on this foundation, it constructs a collaborative innovation mechanism from four aspects: mindset, organizational structure, resources, and service content, and subsequently establishes a safeguard mechanism for the collaborative innovation entity from six dimensions: legal policies, management system, funding, talent, technology, and information resources. [结果/结论] The study constructs collaborative innovation mechanisms and safeguard mechanisms for library and information institutions and think tanks from a cooperative alliance perspective, building a platform for their resource integration, collaborative development, function expansion, and social service, thereby realizing the integration of "government, industry, academia, research, and application."

Full Text

Collaborative Innovation and Guarantee Mechanism Construction of Libraries and Information Agencies and Think Tanks from the Perspective of Cooperation Alliance

Zheng Rong[1], **Wang Jie**[1], **Yang Ran**[2] [1] School of Management, Jilin University, Changchun 130022 [2] Library of Shandong Agricultural University, Tai'an 271018

Abstract

[**Purpose/Significance**] This study aims to establish a collaborative innovation mechanism and guarantee mechanism for libraries and information agencies and think tanks, achieving resource integration and collaborative development between the two entities.

[**Method/Process**] Using literature review and case analysis methods, this paper elaborates on the feasibility, necessity, and value significance of collaborative innovation between libraries and information agencies and think tanks. Based on this foundation, it establishes a collaborative innovation mechanism from four perspectives: ways of thinking, organizational structure, resources, and service content. Subsequently, it constructs a guarantee mechanism for the collaborative innovation entity from six aspects: legal policies, management systems, funding, talent, technology, and information resources.

[**Result/Conclusion**] This paper constructs a collaborative innovation mechanism and guarantee mechanism for libraries and information agencies and think tanks from a cooperation alliance perspective, providing a platform for resource integration, collaborative development, function expansion, and social service, thereby realizing the integration of "politics, production, academia, research, and application."

Keywords: cooperation alliance; libraries and information agencies; think tanks; collaborative innovation; guarantee mechanism **Classification Number:** G250 **DOI:** 10.13266/j.issn.0252-3116.2018.19.001

Collaborative innovation represents the effective convergence of innovation resources and elements. It achieves deep cooperation by breaking down barriers between innovation subjects and fully releasing the vitality of talent, capital, information, technology, and other innovation elements [1]. Collaborative innovation is an effective approach to optimizing resource allocation and constitutes the primary development direction of global scientific and technological innovation as well as a key research object of innovation theory [2]. The 18th National Congress of the Communist Party of China and the Third Plenary Session of the 18th Central Committee successively proposed implementing an innovation-driven development strategy, placing greater emphasis on collaborative innovation, and striving to build an innovation system combining industry, academia, and research to construct an innovative country. Both libraries and information agencies and think tanks are crucial positions for knowledge services and decision-making consultation, and the collaborative innovation process among industry, academia, research, and government cannot proceed without resource and service support. Therefore, libraries and information agencies and think tanks are undoubtedly key members of the collaborative innovation system. Li Gang et al. proposed promoting new-type think tank construction through collaborative innovation [3]; Lian Lijun discussed collaborative innovation as an important implementation approach for information assurance in think tank decision support [1]; Sun Hongfei et al. suggested that new-type

university think tank decision-making mechanism construction should build a collaborative decision-making consultation system [4]; Lin Jian pointed out that achieving the positioning of new-type think tanks in the capital requires giving full play to various intellectual resources in the capital and strengthening collaborative innovation [5]; Ian Johnson believed that librarians should prompt enterprise and government decision-makers to fully recognize and understand that libraries indeed play a distinctive positive role, roles that are identical to those of think tanks [6]. The above papers propose the supporting role of collaborative innovation in think tank construction and the path for libraries to support think tank construction, but there is less discussion on establishing collaborative innovation mechanisms between the two. This paper establishes a collaborative innovation mechanism for libraries and information agencies and think tanks, integrating and innovating their resources, aligning their organizational structures, and merging and expanding their functions and services to achieve collaborative development and value co-creation.

1 Feasibility and Necessity Analysis of Collaborative Innovation Between Libraries and Information Agencies and Think Tanks

1.1 Feasibility Analysis

Collaborative innovation between libraries and information agencies and think tanks is built upon their close connections. Compared to think tanks, libraries and information agencies are relatively traditional information service institutions, including public libraries, university libraries, and specialized information agencies, with functions of acquisition, cataloging, classification, preservation, dissemination, and utilization of library and information materials. Think tanks, as emerging information service institutions with strong vitality, are organizations that research, analyze, and participate in formulating public policies, providing policy-oriented research, analysis, and consultation on domestic and international issues to enable policymakers and the public to make informed decisions on public policy issues [8]. Libraries and information agencies and think tanks share many similarities. Li Gang et al. pointed out that intelligence agencies, including libraries, have close functional connections with think tanks, and the functions of think tanks and intelligence agencies are identical [6]; Chu Jingli et al. explored the path for libraries to support think tank construction by analyzing the relationship between libraries and think tanks [7]; Jin Xuehui believed that there has always been some intersection between intelligence and think tanks at both the practical and theoretical research levels, and there is obvious functional overlap between intelligence and think tanks [10]; Zhao Xueyan believed that university libraries have the capability to provide quality services for think tanks in resource integration platforms, editing and push of research reports, information collection and dissemination, and other aspects [11]; Wu Yuliang discussed how libraries and information agencies, as providers and managers of think tank information resources, can play a front-end role

in think tank research [12]; Huang Ruhua et al. pointed out that libraries and information agencies play a fundamental role in the construction of new-type think tanks in China [13]; Chu Jingli et al. believed that libraries, as professional literature and information agencies, should seize opportunities, utilize their advantages, support think tank strategies, and serve think tank construction [7].

IFLA believes that libraries and information agencies have four major functions: preserving human cultural heritage, conducting social education, transmitting scientific intelligence, and developing intellectual resources [14], while think tanks have functions such as providing decision support, guiding public opinion, establishing government image, and cultivating think tank talent. Although there are similarities in functions between libraries and information agencies and think tanks, and some libraries can even provide certain think tank services, most libraries are not yet think tanks. Therefore, cooperation and collaborative innovation between the two is currently a better solution. This can not only reduce the pressure of think tank construction and effectively utilize resources but also strengthen the functions and services of libraries and information agencies and better promote their transformation. The famous Hoover Institution on War, Revolution and Peace at Stanford University developed from the Hoover War Library; the well-known think tank Jane's Information Group established its own physical and online libraries more than 80 years after its founding [15]; the German Max Planck Society (MPI) also has a specialized digital library to provide information resource assurance for researchers [16].

Nanjing University of Information Science and Technology Library provides a successful example of a university library actively cooperating with think tanks to promote collaborative innovation, confirming the feasibility of the collaborative innovation mechanism between libraries and information agencies and think tanks. In 2012, the library signed knowledge service alliance agreements with the Jiangsu Meteorological Service Center and the Ningbo Science and Technology Information Research Institute. Since then, the three parties have relied on the university's advantageous discipline—atmospheric science—and the Collaborative Innovation Center for "Meteorological Disaster Forecasting, Early Warning and Assessment" to continuously advance knowledge creation and value transformation processes in the collaborative innovation entity under the leadership of meteorological industry experts and discipline experts [17]. Currently, the collaborative innovation entity is operating well and has successfully realized functions such as scientific research, talent cultivation, enterprise knowledge services, and government decision support. Members of the collaborative innovation entity actively contribute personnel and resources, share data, conduct joint research, and share achievements, which not only accelerates the research process but also integrates talent wisdom, greatly improving the quality and transformation efficiency of achievements. The increase in research projects and optimization of the service environment promote continuous learning and growth among talent, thus achieving effects that individual institutions cannot realize in talent cultivation, forming a comprehensive talent pool composed of technical talent, professional talent, and management talent. The collabora-

tive cooperation among libraries, government agencies, and research institutes concentrates superior resources and outstanding talent, providing high-quality market assessment services, data services, and competitive intelligence services for enterprise knowledge innovation, technology achievement transformation, and responding to market competition.

1.2 Necessity Analysis

Collaborative innovation between libraries and information agencies and think tanks is not a one-way path of libraries supporting think tank construction but rather a two-way deep cooperation between the two to achieve a win-win effect of 1+1>2. The integration of resources, project collaboration, and platform co-construction between libraries and information agencies and think tanks provide necessary conditions for both to respond to challenges and fulfill functions more effectively.

1.2.1 A Powerful Measure for Libraries and Information Agencies to Respond to Challenges In the context of increasingly widespread network environments and continuously updated information technology, libraries and information agencies must extend functions, expand business, and improve talent quality on the basis of existing resources and services to preserve their advantages and meet high-level user demands, ultimately achieving transformation. Collaborative cooperation with think tanks in scientific research, talent cultivation, and decision support can help libraries and information agencies improve their professional level and actively respond to challenges.

1.2.2 A Convenient Pathway for Think Tanks to Fulfill Functions In the process of scientific research, decision support, talent cultivation, and public opinion guidance, think tanks also need libraries and information agencies as rear support and information portals. Libraries and information agencies are rich in resources and have extensive connections with the public. They can utilize their advantages as resource repositories and social information portals to support think tank construction in resource development, dissemination of new ideas, public opinion guidance, and collection of public will, making cooperation with libraries a more convenient way for think tanks to fulfill functions and realize social value.

2 Value Analysis of Collaborative Innovation Between Libraries and Information Agencies and Think Tanks

Libraries and information agencies and think tanks each have their strengths. Most libraries have unique advantages in resource collection and have formed an information resource system with complete disciplines, distinctive features, rich types, and complementary advantages. Additionally, libraries have a profound foundation and long history in technology platform construction, academic achievement preservation and promotion, discipline service provision, and

interdisciplinary talent cultivation. As social institutions providing decision support, think tanks have excellent advantages in providing decision support, guiding public opinion, establishing government image, and cultivating think tank talent. Collaborative development between libraries and information agencies and think tanks can enable both to learn from each other's strengths, extend think tank intelligence to libraries, facilitate think tank research, and establish pathways for library participation in think tank construction and library transformation into think tanks. The value of collaborative innovation based on common improvement and complementary advantages is illustrated in Figure 1 [Figure 1: see original paper].

2.1 Value for Libraries and Information Agencies

2.1.1 Improving Information Resource Utilization Efficiency and Promoting Value Transformation In fulfilling functions such as providing decision support and guiding public opinion, think tanks need to base their research on substantial information resources and data. As institutions preserving social information wealth, libraries possess large amounts of literature information resources and various database systems, along with certain information and knowledge service capabilities. If libraries serve as knowledge repositories and institutional repositories for think tanks, they can provide information resources for research topics during think tank research. Efficient utilization of information resources can promote the transformation of library information resources into concrete knowledge applied in social life and practice, realizing value transformation and appreciation of library information resources.

2.1.2 Improving Service Quality of Libraries and Information Agencies One of the functions of think tanks is to influence decision-making through high-quality research results, which are often characterized by highly integrated information, knowledge intensity, and strong practicality. Collaboration between libraries and information agencies and think tanks can fully utilize think tank research results to carry out library consultation services. On the basis of existing information services and knowledge services, they can provide high-quality decision-making consultation services and other think tank services, further supporting think tank construction and laying the foundation for successful transformation.

2.1.3 Cultivating New Service Talent for Libraries and Information Agencies Library staff mostly come from different majors with varied experience and expertise. Therefore, they can participate in think tank research as members of think tank project teams, undertaking tasks such as information resource retrieval and research result promotion. This helps library staff accumulate project experience, improve scientific research capabilities and service levels, and broaden library service fields, thereby extending the think tank function of talent cultivation to libraries and cultivating new service talent for them.

2.1.4 Promoting the Transformation of Libraries and Information Agencies into Think Tanks Collaborative development between libraries and information agencies and think tanks provides information resources, human resources, and technical support for think tanks while participating in think tank research projects. This helps libraries learn from existing mature and excellent think tank service methods and research paradigms, thereby extending functions to undertake social responsibilities such as interpreting public policies and establishing government image, ultimately achieving service capacity building and think tank concept-based service transformation.

2.2 Role of Collaborative Innovation for Think Tanks

2.2.1 Providing Multi-dimensional Information Resources and Collecting Public Will for Think Tank Research In the era of knowledge economy, think tanks need to fully utilize internal and external resources for knowledge development and utilization to adapt to complex and changing external environments and increasingly sophisticated decision-making consultation demands [15]. Libraries can provide a solid foundation of information resources for think tank research, especially the characteristic databases constructed by various libraries, which often concentrate multi-dimensional information resources on specific topics or disciplines with pertinence, completeness, continuity, and systematicity. Digital libraries or smart libraries can provide multi-dimensional, three-dimensionally interconnected information resources for think tanks, not only supporting researchers' access to knowledge through various terminal devices but also accepting intelligent instructions to provide researchers with convenient work environments anytime and anywhere. In terms of collecting public will, as libraries are information portals facing the general public with large and diverse audiences, they are convenient for gathering public opinions and providing valuable factual data for think tank research.

2.2.2 Providing Human Resources for Think Tank Research Library staff are mostly interdisciplinary talents with rich experience in information retrieval, information resource construction, and information services—precisely the kind of talent needed as project members in think tank research. Many libraries have already achieved the integration of resources and the interconnection of experts. Such dynamic networks can not only quickly locate relevant experts according to think tank needs but also realize a talent rotation mechanism between think tanks and libraries, promoting knowledge integration among talent. Additionally, library discipline experts can provide discipline knowledge services, reducing the human resource burden on think tank teams and improving think tank research efficiency.

2.2.3 Providing Technical Support for Think Tank Research Most libraries have complete technical infrastructure, from using digital technology to collect and manage information resources, to cloud computing processing massive data, to the Internet of Things achieving three-dimensional interconnection

among libraries—all reflecting the application and development of information technology in the library field. Extending libraries' intelligent infrastructure and information technology to think tanks can make think tank research and services intelligent. Under the big data environment, technical support from libraries for think tank research can help think tanks conduct big data construction and deep data mining.

2.2.4 Providing Institutional Repositories and Communication Portals for Think Tank Achievement Preservation and Promotion Libraries' characteristics of wide audiences, three-dimensional interconnection, and cross-media communication provide conditions for think tank achievement preservation and promotion. Libraries should fully utilize their advantages to promote think tank achievements to society through various methods, such as printing brochures, regular lectures, setting up exhibition boards and display stands, and editing video clips, enabling the public to understand the latest think tank research results and fulfilling think tanks' responsibilities of disseminating and interpreting policies, guiding public opinion, and establishing government image. Libraries can also collaborate with think tanks to establish user archives, recording users' commonly used information resource types, research directions, service processes, and service feedback. Long-term accumulation forms a database that can be used to analyze user dynamics and changes, providing more precise services for users [11].

3 Construction of Collaborative Innovation Mechanism Between Libraries and Information Agencies and Think Tanks

3.1 Collaborative Methods Between Libraries and Information Agencies and Think Tanks

Although libraries and information agencies and think tanks are different social information institutions, they have close connections in function and mission. Therefore, they can establish collaborative relationships at various levels through multiple methods to achieve complementary advantages.

3.1.1 Collaboration Based on Information Resource Integration Collaboration based on information resource integration is suitable for libraries and information agencies and think tanks that have initially established cooperative relationships. Both parties aggregate and integrate information resources, eliminate duplicate, useless, and outdated literature, analyze and mine resources to achieve innovation, and ultimately establish connections among information resources and a unified access mode, providing information resource assurance for the scientific research services of libraries and information agencies and think tanks.

3.1.2 Collaboration Based on Project Orientation Collaboration based on project orientation refers to establishing collaborative relationships between

libraries and information agencies and think tanks through research or service projects. With the goal of completing projects with high quality and efficiency, libraries and information agencies and think tanks achieve collaborative innovation through processes such as information resource integration, human resource sharing, and joint construction of technical resources.

3.1.3 Collaboration Based on Virtual Organization Alliance Virtual organization alliance represents an advanced level of cooperation between libraries and information agencies and think tanks. In virtual organization alliances, both parties can achieve multi-level integration and collaboration, including cooperative collection, analysis, and utilization of resources, joint completion of research and service projects, joint training of staff and users, and information synchronization and sharing.

3.2 Collaborative Innovation Mechanism

According to cybernetics theory, collaboration connects independently operating components to achieve an overall effect greater than the sum of individual effects [18]. The collaborative innovation mechanism between libraries and information agencies and think tanks is a mechanism for deep integration in thinking, organizational structure, resources, and service content under the guidance of value co-creation concepts. Its purpose is to combine the strengths of both, share innovation risks, share innovation results, and realize value creation that would be difficult for either libraries and information agencies or think tanks to achieve alone. The author establishes a collaborative innovation mechanism from four aspects (see Figure 2 [Figure 2: see original paper]), where collaborative innovation in thinking is the premise, collaborative innovation in organizational structure is the foundation and support, collaborative innovation in resources is the core and essence, and collaborative innovation in service content is the goal and value of the collaborative innovation mechanism.

3.2.1 Collaborative Innovation in Thinking To achieve deep collaborative innovation, libraries and information agencies and think tanks must first transform people's ways of thinking. Library service personnel and think tank staff should abandon resistant attitudes, accept new ways of thinking, and actively integrate the knowledge they possess during collaboration, learning from each other and improving together. Collaborative innovation in thinking is the prerequisite for all other aspects of collaborative innovation. Only with the willingness to collaborate in thought and psychology can the establishment of collaborative innovation mechanisms be promoted in practical work. Therefore, the willingness for collaborative innovation in thinking is the driving force for actual collaborative innovation work.

3.2.2 Collaborative Innovation Between Organizational Structures In the process of cooperative project research, libraries and information agencies

and think tanks should have reasonable organizational structures for overall arrangement, providing good foundational support for collaborative innovation. The author believes that a matrix organizational structure is most conducive to the exchange, integration, and efficient work of personnel from both parties. Different functional departments are set up vertically, while project research is carried out in the form of horizontal project teams led by experienced team leaders who select relevant staff from libraries and information agencies and think tanks to participate, assigning tasks according to personnel expertise to maximize their abilities and cooperate with each other (see Figure 3 [Figure 3: see original paper]). Meanwhile, team leaders should focus on creating a harmonious, harmonious, and sharing organizational culture, enabling each member to truly integrate, find a sense of belonging, and achieve spiritual satisfaction. Additionally, in the process of task decomposition, full consideration should be given to the differences and advantages of libraries and information agencies and think tanks to achieve complementary advantages and tacit cooperation.

3.2.3 Collaborative Innovation in Resources The survival and development of libraries and information agencies and think tanks are closely related to the construction of various resources, and resources are also the core of establishing a collaborative innovation entity. Without resource integration and innovation, collaborative innovation between libraries and information agencies and think tanks would be like water without a source or a tree without roots. Therefore, collaborative innovation in resources is the key to establishing a cooperation alliance between libraries and information agencies and think tanks. The integration of information resources, human resources, and technical resources enhances the strength of both parties and lays a solid resource foundation for them to conduct business and improve services.

(1) Collaborative Innovation in Information Resources. Collaborative innovation in information resources should be based on users' information needs, aim at extensively collecting relevant information, focus on information integration as the key work, and be driven by think tank services and achievement dissemination. Collaboration is by no means a simple superposition of information from both parties but rather the effective integration of information resources from libraries and information agencies and think tanks. Information resource integration is an optimal combination state of information resources. It refers to the fusion, clustering, and reorganization of data objects, functional structures, and their interactive relationships from various relatively independent information resource systems according to certain needs, recombining them into a new organic whole to form a new information resource system with better performance and higher efficiency [19]. This process includes not only the integration of online and offline resources from libraries and information agencies and think tanks, achieving cross-database retrieval of heterogeneous information resources through unified retrieval via OPAC systems, hyperlinks, and establishment of portal websites, but also deep information fusion between libraries and information agencies and think tanks, achieving value addition of information through

information filtering, analysis, and mining.

(2) Collaborative Innovation in Human Resources. Rational allocation of human resources can greatly improve work efficiency. Among professionals at the famous American think tank RAND Corporation, a considerable number are engaged in library and information work [20]. Collaborative innovation in human resources between libraries and information agencies and think tanks is based on the complementary advantages of personnel from both parties. Collaboration can enable the integration of knowledge backgrounds and structures of personnel from both parties, thereby achieving knowledge innovation. Libraries and information agencies and think tanks should also collaborate on human resource training. Whether for libraries or think tanks, the environment they face is dynamic, and project needs are constantly evolving. Therefore, the knowledge and capabilities possessed by service personnel also need continuous improvement and updating, achieving knowledge reorganization and optimal allocation through the mutual transformation of explicit and implicit knowledge. Additionally, personnel from libraries and information agencies and think tanks should implement a "revolving door mechanism," where researchers "revolve" out to serve as policy research center members, applying research results to guide policy formulation, while former government officials "revolve" in to undertake policy analysis tasks, fully utilizing their intelligence knowledge [21], promoting research advancement and achievement transformation and forming a virtuous cycle.

(3) Collaborative Innovation in Technical Resources. To achieve high-quality output, libraries and information agencies and think tanks inevitably need corresponding technical support. Collaborative innovation in technical resources requires not only the effective integration of existing technical resources from libraries and information agencies and think tanks, such as integrating databases and automated integrated systems to achieve technical resource collaboration and conducting cloud services to achieve innovation and appreciation of massive information resources and convenient user access, but also timely technical research and development and innovation or the introduction of new technologies and advanced equipment for technical upgrading. For example, in the context of big data and artificial intelligence, libraries and information agencies and think tanks should collaboratively develop or introduce artificial intelligence expert systems, personalized service systems, data management systems, etc., to promote the development of the collaborative innovation entity toward intelligent services.

3.2.4 Collaborative Innovation in Service Content Think tank consultation achievements have important value in supporting decision-making and guiding public opinion. However, think tanks need improvement in external promotion. Therefore, think tanks can fully utilize the knowledge dissemination portal function of libraries to broaden the scope of think tank achievement dissemination, accelerate think tank achievement value transformation, and truly

apply achievements to guiding public opinion, supporting decision-making, and solving practical problems, achieving the integration and unification of "politics, production, academia, research, and application." Traditional library information services include reading services, literature retrieval services, interlibrary loan and document delivery services, scientific and technological novelty search services, selective dissemination of information services, discipline services, and market research services. With the transformation of library service models, libraries are also providing knowledge consultation and enterprise competitive intelligence services. Collaboration between libraries and information agencies and think tanks helps them further provide high-quality intelligence services and authoritative think tank consultation services while strengthening and deepening existing information services and knowledge services, improving service quality and level, and achieving value addition and innovative services that are difficult to realize through individual efforts.

4 Guarantee Mechanism for Collaborative Innovation Between Libraries and Information Agencies and Think Tanks

The collaborative innovation process between libraries and information agencies and think tanks cannot proceed without guarantee support from external environments and internal conditions. Therefore, it is necessary to establish and improve a collaborative innovation guarantee mechanism. The author establishes a collaborative innovation guarantee mechanism composed of legal policy guarantee mechanism, management system guarantee mechanism, funding guarantee mechanism, talent guarantee mechanism, technology guarantee mechanism, and information resource guarantee mechanism, as shown in Figure 4 [Figure 4: see original paper].

4.1 Legal Policy Guarantee Mechanism

The government can guide the sustainable and healthy development of the collaborative innovation entity from the outside through the formulation of laws and regulations, creating a favorable policy and cultural atmosphere for the collaboration between libraries and information agencies and think tanks. First, laws and regulations can clarify the principles, purposes, nature, functions, etc., of the collaborative innovation entity at the legal level. Second, the development of the collaborative innovation entity requires legal and policy guarantees for its funding and resource rights and interests, stipulates normal procedures for personnel appointment and removal, and publishes standards and methods for service provision. National emphasis on the development of libraries and information agencies and think tanks at the legal and policy level points out the development direction for the collaborative innovation entity.

4.2 Management System Guarantee Mechanism

Libraries and information agencies and think tanks should break the fragmented administrative management system where each operates independently, establish organic connections, and formulate unified coordination plans for overall planning [22]. Specifically, at the macro level, they should improve their own construction according to policies and regulations, integrate resources, and unify actions. At the micro level, they should establish management systems for the collaborative innovation entity, including personnel management, performance assessment, funding management, and risk control, to organize and coordinate resource allocation and task division and collaboration. The management system also needs to establish smooth and effective online and offline communication channels so that members of the collaborative entity can exchange views on resources, projects, daily management, and other issues.

4.3 Funding Guarantee Mechanism

Sustainable collaborative innovation between libraries and information agencies and think tanks requires adequate funding support and multi-channel funding sources, which constitute good guarantees for the stable development of the collaborative innovation entity [23]. Therefore, the collaborative innovation entity should establish a unified funding management system, recording funding sources and specific expenditures such as personnel salaries and project details to ensure reasonable, transparent, and supervised use of funds.

(1) Government Appropriation. Many libraries and information agencies and think tanks are state institutions enjoying full government appropriation, such as university libraries, public libraries at all levels, party and government think tanks, and national policy research centers.

(2) Service Income. Additionally, collaborative innovation entities composed of libraries and information agencies and think tanks can provide high-level knowledge services and intelligence services for enterprises, industries, and sectors to obtain certain financial returns.

(3) Social Donations. Libraries and information agencies and think tanks can obtain resources or funding support through social donations. The Hoover Institution has received donations from companies such as ExxonMobil, Ford Motor, General Motors, and Procter & Gamble.

4.4 Talent Guarantee Mechanism

To achieve high-quality output, the collaborative innovation entity first needs to ensure adequate expert talent resources. Various types of talent are the living soul of the collaborative innovation entity and can be attracted through multiple methods, including internal full-time staff, external hiring, and part-time positions [24]. At the same time, attention should be paid to the cultivation of internal experts through regular training and assessment to improve the service

and research capabilities of existing talent in libraries and information agencies and think tanks, forming a strong and sustainable expert resource pool.

(1) Information Technology Experts. Information technology experts include system design, operation, and maintenance personnel, data analysis personnel, and program development personnel, responsible for ensuring information security and technology development and updating of the collaborative innovation entity of libraries and information agencies and think tanks.

(2) Information Service Experts. The collaborative innovation of libraries and information agencies and think tanks aims to better provide services. Service is the core of the collaborative innovation entity, and service quality concerns its survival and development. Therefore, information service experts are the face of the collaborative innovation entity. They should not only strive to improve service quality but also possess good service attitudes and dedicated service spirits.

(3) Management Experts. For the collaborative innovation entity to operate well, it needs not only technical and service talent but also management personnel capable of managing the entire innovation system. This requires managers not only to have overall planning abilities but also to have forward-looking vision.

4.5 Technology Guarantee Mechanism

Collaborative innovation between libraries and information agencies and think tanks and joint service development must have strong technical support. Therefore, libraries and information agencies and think tanks can cooperate to build cloud service platforms, introduce artificial intelligence expert systems, and use technologies such as cloud computing, cross-database retrieval, and load balancing to provide technical support for think tank services.

(1) Mobile Internet Technology. The development of mobile Internet enhances the timeliness of information acquisition and is not limited by space. Libraries can provide instant information services through software and platforms such as WeChat, Weibo, and RSS subscriptions, and can also use these platforms to display and promote think tank achievements. Establishing public accounts and portal websites for the collaborative innovation entity as interactive platforms for service delivery, public opinion dissemination, and public will collection can fully leverage the advantages of mobile Internet and improve the work efficiency of the collaborative innovation entity.

(2) Big Data and Cloud Computing Technology. High-quality knowledge services and intelligence services inevitably require data analysis and mining. Think tank consultation relies on facts and data. In the big data environment, personnel of the collaborative innovation entity can only fully explore the value contained in data and support high-quality services of the collaborative innovation entity by mastering data analysis technology and cloud computing

technology.

(3) Artificial Intelligence Technology. Artificial intelligence plays a prominent role in information organization and retrieval and knowledge services. Using semantic webs and ontologies to organize information resources of the collaborative innovation entity is more effective than traditional methods. The expert system of the collaborative innovation entity can partially replace librarians in providing common and simple services, saving manpower and extending service time.

4.6 Information Resource Guarantee Mechanism

Information resources are the core of service development. Without information resource support, services cannot be discussed. Therefore, information resource construction is the source of other work, including the collection and organization of paper resources, database resources, and network information resources.

(1) Paper Literature Resources. Paper literature resources are paper books, journals, newspapers, and other resources owned by libraries and information agencies and think tanks, with huge quantities that increase annually. Libraries and information agencies and think tanks should purchase, properly preserve, timely update, and reasonably develop and utilize paper literature resources according to needs, especially precious ancient books, which are not only valuable materials for verifying certain topics but also historical artifacts.

(2) Database Resources. Database resources refer to various database systems purchased or self-built by libraries and information agencies and think tanks. With the rapid development of mobile Internet technology, database resources are favored by various libraries and information agencies and think tanks due to their small space occupation, large storage capacity, and convenient use. Therefore, the collaborative innovation entity should timely purchase database resources needed for scientific research and digitize important paper literature.

(3) Network Information Resources. Network information resources are information resources disseminated and circulated through the Internet, with large data volumes and real-time updates. Most think tank research is based on factual data, so besides field investigation, obtaining real-time data online is also an important approach. Network information resource construction requires effective organization of semi-structured and unstructured web resources related to projects for retrieval and utilization.

Libraries and information agencies and think tanks, as social information institutions, possess large amounts of intellectual resources and various information resources in society. They can actively cooperate and perform their respective functions in China's innovation-driven strategy to promote China's scientific and technological innovation. This paper, from the perspective of cooperation alliance, discusses the feasibility, necessity, and value significance of collaborative

innovation between libraries and information agencies and think tanks, and on this basis, establishes collaborative innovation mechanisms and guarantee mechanisms for them. The construction of collaborative innovation mechanisms and guarantee mechanisms for libraries and information agencies and think tanks cannot be accomplished overnight or once and for all, and their operational effects and evaluation mechanisms require further research and improvement.

References

[1] Lian Lijun. Research on the Collaborative Innovation Mechanism of Decision Support Information Assurance for Characteristic Think Tanks[J]. Library Science Research, 2014(7): 62-65.

[2] Yang Jingguang. Research on the Collaborative Innovation Mechanism of Library Consortia[J]. Library Work and Research, 2015(4): 41-45.

[3] Li Gang, Li Yang. Intelligence Services for Decision-making Oriented to Think Tank Collaborative Innovation: Function Positioning and System Construction[J]. Library and Information, 2016(1): 36-43.

[4] Sun Hongfei, Peng Li, Wu Huijuan, et al. Research on the Construction of Decision-making Mechanisms for New-type University Think Tanks Based on Collaborative Innovation Concepts[J]. Education Theory and Practice, 2017, 37(33): 7-9.

[5] Lin Jian. Promoting the Construction of New-type Think Tanks in the Capital with Collaborative Innovation[N]. Beijing Daily, 2016-02-26(3).

[6] Johnson, Chen Xuyan. Smart City, Smart Library and Smart Librarian[J]. Library Journal, 2013, 32(1): 4-7.

[7] Chu Jingli, Tang Guoyuan. Libraries and Think Tanks[J]. Library and Information Work, 2018, 62(1): 1-7.

[8] MCGANN J G. 2015 Global Go To Think Tank Index Report[EB/OL]. [2018-01-20]. http://repository.upenn.edu/cgi/viewcontent.cgi?article=1008&context=think_{tank}.

[9] Li Gang, Li Yang. Research on Think Tank Construction from the Perspective of Intelligence[J]. Library and Information Work, 2015, 59(11): 36-41, 61.

[10] Jin Xuehui, Fu Hong. A Comparative Study of Intelligence and Think Tanks—Based on Theoretical Research Perspective[J]. Library and Information Work, 2017, 61(7): 42-49.

[11] Zhao Xueyan, Peng Yan. Research on the Advantages and Paths of University Library Participation in University Think Tank Construction and Services[J]. Library and Information Work, 2016, 60(22): 28-33.

[12] Wu Yuliang. The Front-end Role of Libraries and Information Agencies in Think Tanks[J]. Library and Information Work, 2012, 56(S2): 29-31.

[13] Huang Ruhua, Li Baiyang, Rao Xueyu. Knowledge Services for New-type Think Tank Construction: New Opportunities for Libraries and Information Agencies[J]. Library, 2015(5): 6-9.

[14] Zhao Daxiong. Inheritance and Innovation of the Four Major Functions of Libraries[J]. Library Theory and Practice, 2000(1): 13-16.

[15] Pang Yuanyan, Ye Xin, Pang Yufeng. Enlightenment from Foreign Think Tank Media Groups—Taking Jane's Information Group as an Example[J]. Publishing Wide Angle, 2016(2): 26-28.

[16] Max Planck Institutes[EB/OL]. [2017-12-20]. https://www.mpg.de/institute.

[17] Nie Fengying. Practical Exploration of Library Knowledge Service Alliance Based on Collaborative Innovation[J]. Library Work and Research, 2015(5): 65-68.

[18] Hu Changping, Yan Hao. Research on the Innovation of Knowledge Management Activities—Collaborative Knowledge Management[J]. Journal of Library Science in China, 2007(3): 95-97.

[19] Wang Cuiping. On the Information Resource Integration of Personalized Services[J]. Information and Documentation Services, 2005(4): 37-40.

[20] Wang Peiheng, Li Guoqiang. Overseas Think Tanks: Investigation Reports on Major Countries' Think Tanks in the World[M]. Beijing: China Financial & Economic Publishing House, 2014.

[21] US Think Tank: China May Learn from Foreign "Revolving Door" to Allow Think Tank Talent to Enter Government[EB/OL]. [2017-12-30]. http://news.163.com/17/0214/14/CD890DP100018AOQ.html.

[22] Wen Tingxiao, Chen Nenghua. Research on Information Resource Sharing and Its Social Coordination Mechanism[J]. Journal of Library Science in China, 2007(3): 78-81.

[23] Wang Hong. The Mission and Service Innovation of Libraries and Information Agencies in National Think Tank Construction[J]. Library and Information Work, 2015, 59(14): 46-50.

[24] Zhang Xu, Zhang Xiangxian. Research on the Think Tank Information Service Model of University Libraries[J]. Library Science Research, 2017(14): 59-65.

Author Contributions

Zheng Rong: Proposed research ideas and framework, guided paper writing and revision. Wang Jie: Wrote and revised the paper, created figures. Yang Ran: Revised the paper, created figures.

Collaborative Innovation and Guarantee Mechanism Construction of Libraries and Information Agencies and Think Tanks from the Perspective of Cooperation Alliance

Zheng Rong[1], Wang Jie[1], Yang Ran[2] [1] School of Management, Jilin University, Changchun 130022 [2] Library of Shandong Agricultural University, Tai'an 271018

Abstract: [Purpose/significance] This paper aims to establish the cooperative innovation mechanism and guarantee mechanism of libraries and information agencies and think tanks, achieving resource integration and collaborative development between them. [Method/process] Using literature review and theoretical research methods, this paper elaborates on the feasibility, necessity, and value significance of collaborative innovation between libraries and information agencies and think tanks. Based on this, it establishes the cooperative innovation mechanism from four aspects: ways of thinking, organizational structure, resources, and service content for libraries and information agencies and think tanks, and then establishes the guarantee mechanism of the collaborative innovation entity from six aspects: legal policies, management systems, funds, talents, technologies, and information resources. [Result/conclusion] This paper constructs the cooperative innovation mechanism and guarantee mechanism of libraries and information agencies and think tanks from the perspective of cooperation alliance, providing a platform for resource integration, collaborative development, function expansion, and social service, thereby realizing the integration of "politics, production, learning, research, and application."

Keywords: cooperation alliance; libraries and information agencies; think tanks; collaborative innovation; guarantee mechanism

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