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## Systematic Thinking on Logical System of Think Tank Research

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## Systematic Thinking on Logical System of Think Tank Research

### Abstract

As an important part of the national decision-making consulting system, theoretical and methodological think-tank research could contribute to improve the level of think tank research, expand the scope of the questions concerned, and effectively exert its role and functions. This paper views think tank research as the object of investigation, and reflects theoretically on the more general role and characteristics, the principles and logic system, the process and methods, and the evaluation criteria of think tank products, which forms a systematic thinking of the logical system of think tank research.

### Keywords

think tank; theoretical research; logical system of think tank research; evaluation criteria

### Authors

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## Systematic Thinking on Logical System of Think Tank Research

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**Abstract:** As an important part of the national decision-making consulting system, theoretical and methodological think-tank research could contribute to improving the level of think tank research, expand the scope of the questions concerned, and effectively exert its role and functions. This paper views think tank research as the object of investigation, and reflects theoretically on the more general role and characteristics, the principles and logical system, the process and methods, and the evaluation criteria of think tank products, which helps form systematic thinking on the logical system of think tank research. **DOI:** 10.16418/j.issn.1000-3045.2018.10.010-en

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### 1 Problem and theoretical review

In January 2015, the Central Committee of the Communist Party of China (CPC) issued the “Opinions on Strengthening the Construction of New Types of Think Tanks with Chinese Characteristics.” It stated that the construction of new types of think tanks with Chinese characteristics should be effectively strengthened, so as to play an important role in the governance and administration of state affairs. In December 2015, the pilot program for the construction of national high-end think tanks was officially launched. The first 25 institutions were announced to be selected as national pilot high-end think tanks, covering the first-class professional research institutions in China’s politics, economy, science and technology (S&T), and military. Among them, as an important carrier and comprehensive integration platform for the Chinese Academy of Sciences (CAS) to establish national high-end S&T think tanks initiatively, the CAS Institutes of Science and Development (CASISD) mainly provides suggestions on S&T issues.

The construction and study of think tanks have critical political and theoretical values. On one hand, think tanks have become indispensable to the national governance system and an important reflection of a country’s governance capacity. In the process of promoting the modernization of the national governance system and capacity, as the institutionalized and professional consulting and research organization, high-end think tanks are not only of vital significance to a country’s soft power, but also an important institutional guarantee for the scientific and standardized national decision-making<sup>[1]</sup>. On the other hand, Chinese think tanks have limited engagement in decision-making consultation

and limited capacity to deliver valuable research to respond to the increasingly complex decision-making issues. Most of the decision-making consulting departments in the existing system serve decision-makers directly, which focus more on major real-world issues. However, scientific and democratic decision-making should be supported by more independent and objective research results and gain a long-term and forward-looking vision, which requires basic and reserve research power. At the same time, as a momentous part of the national decision-making consulting system, the research on the theory and methods of think tanks themselves is beneficial to improving the level of think tank research, expanding the scope of concerns, and effectively playing their role and function. It is very important to understand and bring the role of think tanks to full play, conduct valuable think tank research, and form a knowledge of the logical system of think tank research.

With the emergence of modern think tanks in western countries in the late 19th century, theoretical studies or empirical studies of think tanks began to spring up<sup>[2–3]</sup>. Most of these studies are conducted in the context of the Western English-speaking countries represented by the US based on their own national contexts. Since the 1990s, the think tank research with the developing countries in Central and Eastern Europe as well as Asia as the context has emerged<sup>[4–6]</sup>. From the perspectives of elitism and pluralism, the theoretical studies of western think tanks try to systematically consider the definition, role, and function of think tanks, and to address the questions of “what is a think tank,” “how does it work,” and “whom does it serve”<sup>[7–11]</sup>. An early and widely accepted definition of think tanks was proposed by Weaver<sup>[12]</sup> in the late 1980s. He defined a think tank as “a

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non-governmental, non-profit research institution that maintains its independence from government, business, parties, and other interest groups.” Thus, in the western context, independence has become one of the important criteria for judging the nature of a think tank. However, Weaver’s definition does not exclude the institutions that receive funding and program support from the government. Some more recent studies have begun to move away from a discussion of the organization attributes and funding methods of think tanks. They viewed think tanks as special knowledge regimes in the service of policymaking<sup>[13]</sup> and described think tank research as a “mode of production of knowledge and ideology that embodies pluralism”<sup>[14]</sup>. Think tanks exhibit a more public spirit and provide research as a public product. They shape concepts, initiatives, ideas, and opinions into products and spread them to the effective public<sup>[15]</sup>. Meanwhile, think tanks develop and maintain policy networks, provide professional services to policy makers, and act as a bridge between different subjects in the policy space, such as government, academic institutions, enterprises, and the media.

From a pluralist perspective, think tanks are also positively regarded as playing an important role in supporting and encouraging policy diversity, promoting broad and multi-subjective political participation, improving the quality and transparency of policymaking, and fostering a credible and open democratic political process. However, the elitism-based opinions are more critical of think tanks. On one hand, the studies and opinions of think tanks often represent the interests of funding agencies and communicate them to policy makers. On the other hand, the consistency of think tanks in their origins, especially their narrow social contexts, elitist value, and the position of serving elite decision-makers cause the empirical studies to often have an elitist perspective and fall into the unfair power relationship<sup>[16]</sup>. Thus, the theoretical perspective to the understanding of think tanks is of leading and fundamental importance to understanding the role and function of think tanks as well as to the progress and evaluation of think tank research so as to effectively play the role of think tanks in a country’s governance system.

Whether based on the organizational structure of think tanks, or based on the pluralist or elitist perspective, theoretical studies of foreign think tanks are carried out mainly in the context of the western political systems. A theoretical perspective tends to only focus on one aspect of the characteristics of think tanks. For example, the pluralist perspective is based on the openness and knowledge production of think tanks, while the elitist perspective is based on the homogeneity and the class attribute of think tanks. Therefore, it is of great theoretical meaning that how to adopt a systematic perspective to consider this phenomenon of think tanks with the purpose of forming a logical system of think tank research. Currently, such studies are rare in both the academic community and think tanks in China where the understanding of think tank research is still unclear. There is a lack of systematic consideration for the role and

studied problems of think tanks, and the system and theory of think tank research have not been formed<sup>[17]</sup>.

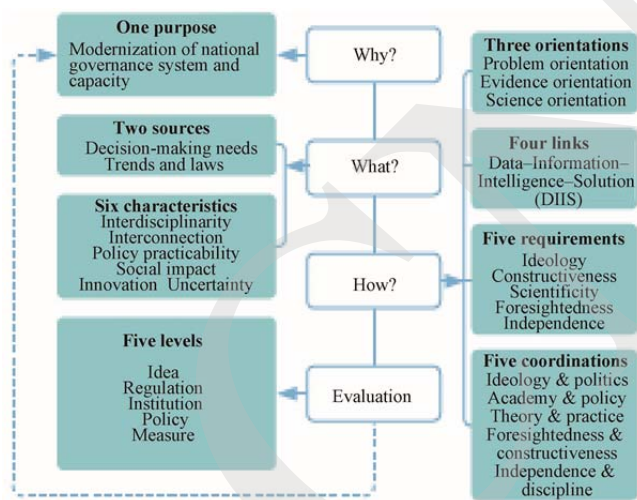
Therefore, this paper comprehensively integrates our achievements in the theory and methodology of think tank research and proposes a basic logical system for think tank research<sup>[18–22]</sup>. On the one hand, with the think tank research as the investigation object, we step out of specific social conditions and use the idea of systems theory to consider the more general role and characteristics of think tanks, as well as the principles and logical system that think tank research should follow at the theoretical level. On the other hand, from the realistic demand of building high-end think tanks in China to modernize the national governance system and capacity, we provide practical suggestions on the organization construction and achievement evaluation of think tanks. The main part of this paper investigates the role of think tanks in serving macroscopic decision-making, leading the innovation direction, and innovating research methods and tools, and then proposes the basic logical system of think tank research. We will explain the questions of “why,” “what,” “how,” and “how to evaluate” in think tank research, so as to systematically understand the purpose, sources, orientations, process, requirements, and characteristics of such research. In the process of constructing a logical system, we focus on the questions of both academic and practical values, such as “how think tank research problems are raised,” “what are the sources and characteristics of think tank research problems,” “how to conduct think tank research,” and “how to evaluate the results of think tank research.” In the section of conclusions, this paper proposes possible questions and directions for future think tank research.

## 2 Understanding of basic logical system in the theory of think tank research

Different political systems, levels of economic development, socio-cultural characteristics, and specific historical periods have a significant impact on the role, function, organization, and structure of think tanks. However, the dual influence of think tanks on decision-making and the public, the pluralism and openness of think tank research, and their independence from interest groups with people’s well-being as their fundamental starting point exist independently of the political context. We try to go beyond the limitations of political system and cultural background, and discuss the more essential roles and functions of think tanks with the think tank research as the investigation object. In fact, think tanks mainly play a role in serving macroscopic decision-making, leading the innovation direction, and innovating research methods and tools. First, in serving macroscopic decision-making, think tanks mainly provide independent and objective scientific evidence and consulting suggestions through consultation and participation in decision-making research. In order to play a good role in serving the national macroscopic decision-

making, think tanks should play a role in the following four areas: ① conducting research on major issues of overall importance and providing consulting reports on issues of concern to the government from the perspective of think tanks; ② consulting and discussing reform proposals and policy measures, and developing the third-party evaluation of policies and measures before publication; ③ evaluating implementation of major decision-making programs and policy measures; ④ grasping trends and rules as well as setting important research topics in time to conduct forward-looking and reserve research. Second, in leading the innovation direction, think tanks release public reports and hold seminars to influence the public and promote social progress in terms of scientific concepts, methods, and culture. Finally, in terms of innovating research methods and tools, think tanks ensure the scientific and authoritative nature of their research and acquire the recognition of their peers by publishing papers as well as developing methods and tools of think tank research.

On the basis of clarifying the role of think tanks, this paper proposes a basic logical system of think tank research theory, focusing on questions of “why,” “what,” “how,” and “how to evaluate.” The establishment of this logical system (Figure 1) facilitates a more systematic understanding of the functions and roles of think tanks, and provides a logical framework for developing high-end think tank research.



**Figure 1** Basic logical system of think tank research

## 2.1 The question of “why”: What is think tank research for?

Ultimately, one of the purposes of think tank construction and research in China is to serve the modernization of the national governance system and capacity. The modernization

of China’s national governance system and capacity was proposed in November 2013. The Third Plenary Session of the 18th CPC Central Committee put forward that “The overall objective of comprehensively deepening reform is to improve and develop the system of socialism with Chinese characteristics and promote the modernization of our national governance system and capacity.” The modernization of national governance system and capacity, which can be called the fifth modernization<sup>①</sup>, is one of the major breakthrough developments in China’s political system. It extends from the economy and society levels to the institutional level, providing institutional guarantees for the modernization of China. Making the modernization of national governance system and capacity the overall goal of comprehensively deepening reform is of great and far-reaching theoretical and practical significance to China’s political development as well as the whole socialist modernization in China. Based on this, the Third Plenary Session of the 18th CPC Central Committee released the “Decision of the CCCPC on Some Major Issues Concerning Comprehensively Deepening the Reform,” which explicitly stated that “we will strengthen the building of new types of think tanks with Chinese characteristics, and establish and improve the consultation system on decision-making.” This signified that think tanks have become an important institutional arrangement for the modernization of national governance system and capacity, and that think tanks have been elevated to a national strategic level. In January 2015, the General Office of the CPC Central Committee and the General Office of the State Council issued the “Opinions on Strengthening the Construction of New Types of Think Tanks with Chinese Characteristics,” pointing out that the construction of new types of think tanks with Chinese characteristics should be effectively strengthened and the important role of think tanks in the governance and administration of state affairs should be fully played. In February 2017, the 32nd meeting of the Central Leading Group for Comprehensively Deepening Reforms approved “The Construction Plan of National S&T Decision-making Consultation System,” which decided to establish a “National S&T Decision-making Consulting Committee” to directly serve the major decisions of the CPC Central Committee, and clarified that China would establish a supreme think tank for S&T decision-making. This incorporates S&T decision-making consultation into the national decision-making process, which is a major breakthrough in S&T decision-making. In the process of promoting the modernization of national governance system and capacity, think tanks, as institutional and professional consultation and research organizations, are not only an important part of national soft power, but also a

① With achieving modernization as the goal of development, China has proposed the “four modernizations” and continuously adjusted their meanings with the economic and social progress. It has undergone the modernization of “industry, agriculture, transport, and national defense” proposed by the First National People’s Congress in 1954, the modernization of “agriculture, industry, national defense, science and technology” proposed by the Third National People’s Congress in 1964, and “new type of industrialization, informatization, urbanization, and modernization of agriculture” proposed by the Eighteenth National Congress of the CPC in 2012.

crucial institutional arrangement for the scientific and standardized national decision-making.

## 2.2 The question of “what”: What are sources and characteristics of think tank research?

In July 2013, General Secretary Xi Jinping visited CAS and asked CAS to “take the lead in establishing a national high-end S&T think tank.” Xi pointed out that the research on S&T think tanks should study major issues of overall importance from the perspective of the impact and role of S&T, and consider the S&T development trend in advance from the perspective of S&T laws, so as to put forward advice and suggestions, carry out science evaluation, make predictions, and play a constructive role in national macroscopic decision-making. This requirement has also promoted the establishment of S&T think tanks represented by CASISD. The S&T think tanks focus on “promoting S&T development” and “S&T for development.” They not only consider the development trend of S&T from the perspective of S&T laws, but also study major issues of domestic as well as international economic and social development from the perspective of the impact and role of S&T.

### 2.2.1 Two sources of think tank research: decision-making needs & trends and laws

From the establishment process of S&T think tanks, it can be seen that think tank problems in China come from two sources. On the one hand, these problems come from the decision-making needs in social practice. Selecting major issues from the overall and strategic perspective, we conduct think tank research on major issues before decision-making, consultation and verification for proposals during decision-making, and the following third-party evaluation, and provide alternative constructive proposals, scientific suggestions and evaluations, so as to effectively serve macroscopic decision-making. On the other hand, think tanks need to grasp and study trends and laws. Think tank problems derive from the internal logical evolution of social development. Think tanks have the important mission of grasping trends and laws, proposing important issues for the future, conducting in-depth theoretical research, providing reserve preparatory plans, and leading the innovation direction of social and economic development.

### 2.2.2 Convergence of think tank research: interdisciplinarity, interconnection, policy practicability, social impact, innovation, and uncertainty

The convergence of think tank research is reflected in not only the fact that think tank problems involve multidisciplinary integration of natural sciences, humanities, and social sciences as well as engineering and technical sciences, but also that the issues often arise in the knowledge convergence of S&T, economy, society, environment, and politics. Meanwhile, think tank research is also the convergence of basic frontier, technological innovation, application

transformation, and other value chain links. Think tank research can break through the previous research on a single discipline, a single field or a single value chain. It can obtain new knowledge across disciplines, fields and value chains, and form comprehensive solutions to complex think tank problems, so as to better understand future trends in S&T and support macroscopic decision-making. Therefore, think tank research embodies the convergence of the six characteristics: interdisciplinarity, interconnection, policy practicability, social impact, innovation, and uncertainty (Figure 2).



Figure 2 Convergence of think tank research

① Interdisciplinarity: This indicates the wide information and knowledge required for think tank research, which is a comprehensive study involving multiple disciplines. ② Interconnection: Think tank issues generally do not emerge independently, but are a series of issues interconnected and influenced by each other. ③ Policy practicability: The research results influence government decision-making and public policies. ④ Social impact: The results of think tank research have a huge impact on real-world issues in social, ecological, economic, technological, and other sectors. ⑤ Innovation: We should propose innovative ideas aimed at think tank problems, rather than simply draw on existing experience. ⑥ Uncertainty: The proposed solutions generally concern a long-term horizon and closely related to the external environment and factors.

With S&T think tanks as the study object, we notice that the research objects of S&T think tanks are often complicated, comprehensive strategic and policy issues, which not only involve S&T aspects, but are also related to economic, social, environmental, and management ones. Cases in point are the “International S&T Frontier Research,” “Prospective Study on Major Scientific and Technological Breakthroughs in China,” “Research on Source Technologies for High-Tech Industries Facing Global Competition,” and “Research on Key Bottlenecks of Resources and Environment in a Powerful Nation” developed by CASISD. The S&T issues in these studies are comprehensive interdisciplinary research involving S&T, industry, innovation, resource, and environment.

## 2.3 The question of “how”: How to develop think tank research?

Given the comprehensiveness of think tank problems and



the complexity of studied objects, think tank research especially requires all-round, multi-perspective, and systematic observation and analysis of the development and changes of the world as well as their possible impacts on the economy and society in order to effectively play the role of think tanks in serving macroscopic decision-making, leading the innovation direction, and innovating research methods and tools. Specifically, with regard to S&T think tanks, their tasks and characteristics determine that their research is specialized and requires systematic organization as well as comprehensive integration. In the process of developing the research, on the one hand, the systematic perspective is used to analyze problems. Particularly, we divide the study object into specific S&T issues, economic, and social issues, policy or management issues which are connected with each other, and organize related experts to conduct prospective judgments. On the other hand, it is necessary to use a comprehensive perspective to analyze issues, and to scientifically summarize and comprehensively integrate determinations of experts in S&T, policy, intelligence, and management, so as to extract the consensus to the greatest extent, to form an overall understanding for think tank problems, and to propose policy suggestions and programs to solve the issue. In the process of developing think tank research, we should pay attention to grasping and using the “three orientations,” “four links,” “five requirements,” and “five coordinations” stated below.

### 2.3.1 “Three orientations”: Problem, Science, and Evidence

The Problem, Science, and Evidence orientations of think tank research are determined by the aforementioned purpose of think tank research and the sources of problems. Think tank problems are sophisticated, comprehensive, and interdisciplinary. This requires effective integration and summarization based on a thorough knowledge of relevant disciplines, and finally the problems should be raised to the study of strategic consulting issues. In understanding the orientations of think tank research, it is important to recognize the relationship between academic research and think tank research. To a great extent, academic research provides a source and support for the science-based and evidence-based natures of think tank research, and provides clear and scientific basis for decision-making research. The two form an interactive relationship.

Specifically, Problem orientation requires think tank researchers to analyze through problems, which can be real or potential problems of strategies and policies. Evidence orientation requires arguments to be fact-, scientific evidence-, and data-based. Science orientation means that think tanks should follow the rules and use scientific research methods and tools to conduct scientific, integrated, and systematic research on comprehensive and complex problems.

### 2.3.2 “Four links”: DIIS

The DIIS method describes the four links of think tank research: data collection (Data), information disclosure (Information), comprehensive judgment (Intelligence), and solution formation (Solution), as shown in Figure 3. DIIS is a new method of think tank research oriented by problem, evidence, and science<sup>[19]</sup>. It provides a comprehensive idea and a general process for think tank research, forming a multi-level research method.



**Figure 3** DIIS method of think tank research

This figure was first published in *China Science Daily* in January 9, 2017

DIIS divides the process of think tank research into four links: ① Data collection: Related data and situations involving the studied issue are collected. ② Information disclosure: Specialized information mining, organization, and analysis are conducted to help form objective understanding. ③ Comprehensive judgment: Experts’ experience is introduced to analyze the understanding, so as to obtain new knowledge and new ideas. ④ Solution formation: The solution to specific problem is proposed and the high-quality report is formed.

The DIIS method of think tanks is closely linked to the Problem, Science, and Evidence orientations of think tank research. Under the Problem orientation, the DIIS method can be divided into “refining, analyzing, integrating, and solving problems.” Under the Evidence orientation, it is necessary to ensure real data, objective information, professional research, and reliable solution in the four links of DIIS. Under the Science orientation, it is required to use scientific research methods and tools to systematically study problems to ensure accurate and complete data, comprehensive and reasonable information, independent research, prospective and scientific solutions in the four links of DIIS.

The research on S&T roadmap of CAS is used as an example. Aiming at the goal that China basically achieves modernization in the mid-21st century, CAS launched strategic research on S&T development towards 2050 in 2007 with focus on 18 important areas. During the research period from 2007 to 2013, CAS formed the DIIS theory and methodology and put it into practice by continuously summarizing and refining the research ideas of think tanks. In data collection, the problem is analyzed from a systematic perspective and divided into interrelated sub-problems. In information disclosure, experts from relevant directions are organized to analyze the problem and form objective understanding. In comprehensive judgment, the judgments of experts should be scientifically summarized and comprehensively integrated to condense their consensus to the greatest extent, so as to form new understandings and views. In solution formation, the

overall concept and solutions to the problem are put forward, and the planning schemes as well as policy suggestions which meet actual development requirements should be formed. The strategic research on S&T roadmap was divided into 18 important areas, and corresponding expert groups were set up. It adopted the working mode of centralized discussion, subgroup research, comprehensive integration and iterative improvement, and the comprehensive research method. A series of reports titled *Innovation 2050: Science and Technology and China's Modernization* (hereinafter referred to as the "Roadmap of Innovation 2050") was released in 2009, and a mechanism for developing continuous strategic research was established. This was the first set of panoramic research reports in China for predicting the blueprint of S&T development in 2050. It has attracted widespread attention all over the world, and many views as well as research results have been adopted by government decision-making departments, research institutions, enterprises and social organizations. On the basis of "Roadmap of Innovation 2050," CAS released *Vision 2020: The Emerging Trends in Science & Technology and Strategic Option of China* (hereinafter referred to as "Vision 2020: Strategic Option of China") in 2013. "Roadmap of Innovation 2050" and "Vision 2020: Strategic Option of China" together constitute the medium- and long-term prediction and judgment of S&T development strategy in China.

### 2.3.3 Five requirements: ideological, constructive, scientific, forward-looking, and independent

Throughout the whole process of think tank research, we should adhere to the "five requirements": ① Ideological requirement: It is required to put forward new concepts, ideas, perspectives, and views, and to provide high-quality suggestions and evaluations. ② Constructive requirement: It is required to closely follow the decision-making needs. "Practical and useful," in-depth, insightful, and operable system solutions are proposed based on both the current situation and the long-term circumstance. ③ Scientific requirement: It is required to use scientific methods and to combine qualitative knowledge as well as quantitative analysis based on professional knowledge and scientific evidence, so as to analyze problems comprehensively and systematically and to make scientific arguments. ④ Forward-looking requirement: It is required to keenly anticipate development trends and frontier directions, to be good at identifying regular, essential, and emerging problems, to recognize new situations, problems, and features, and to provide policy suggestions for advanced response and layout optimization. ⑤ Independent requirement: It is required to follow the laws in a highly responsible spirit for the nation and to eliminate the interference of individual, group, and local interests. The research conclusions should be able to stand the test of people, practice, and history.

### 2.3.4 Five coordinations: ideology & politics, academy & policy, theory & practice, foresightedness & constructiveness, and independence & discipline

(1) Coordination of ideology and politics: The work of think tanks is highly political and has big social impact, which must adhere to the correct political direction. The pilot establishment of national high-end think tanks should focus on providing high-end S&T decision-making services for the CPC Central Committee, the State Council, and the Central Military Commission, which should be the starting point and purpose of the work of think tanks. Think tanks should focus on the supporting and leading role of S&T, and recognize and grasp the interaction between S&T and economic & social development, so as to continuously put forward new concepts, ideas, views, and opinions, and to provide high-quality suggestions, evaluations, and comments.

(2) Coordination of academy and policy: Think tanks should establish high theoretical consciousness and self-confidence, and always place academic pursuit and bearing at the core of high-end think tank construction, so as to put forward the judgment from Chinese scientists, and to provide Chinese thoughts for building a community of human destiny. At the same time, think tanks should pay attention to grasping the S&T development trend in the world, research the direction of the new round of S&T revolution, keenly seize the development direction and new growth point of S&T innovation, so as to provide leading and guiding academic judgment for the development of China's S&T industry.

(3) Coordination of theory and practice: We insist on the integration of theoretical innovation, method innovation, and practical application. Our academic research should be oriented toward the S&T frontier problems, major needs of the country, and the national economy. We should combine our academic research with the social reality, so as to achieve the coordination of theory and reality. Moreover, we should use what we have learned to solve social problems and enhance our theoretical cultivation in practice.

(4) Coordination of forward-looking and constructive features: With focusing on the long term and making predictions, we should be good at identifying regular, essential, and emerging issues, as well as recognizing new situations, problems, and features, so as to provide policy suggestions for advanced responses and layout optimization. Think tanks should focus on decision-making needs and analyze from China's basic national conditions and stage characteristics, so as to solve the hotspot and difficult issues as well as bottlenecks of China's development and deal with major global challenges. The think tank research should be beneficial to the modernization of the national governance system and capacity and should also provide "practical and useful," in-depth, insightful, and operable solutions.

(5) Coordination of independence and discipline: On the one hand, the academia should be diverse and research should



be autonomous. In the highly responsible spirit for the nation, we should objectively and independently provide scientific suggestions and comments with the scientific spirit of following laws and challenging authorities. On the other hand, we should insist on “publishing with a bottom line” and strengthen the quality management. The management system and publishing procedures of results are established and improved.

## 2.4 The question of “how to evaluate”: evaluation criteria of high-end think tank research results

Constructing a logical system of think tank research plays a fundamental and guiding role in systematically understanding the purpose, sources, orientations, links and requirements of think tank research, forming unique principles of think tank research, guiding the direction and mode of such research, innovating the management mode of think tank organizations, as well as establishing evaluation standards and systems for think tank results. The complexity and uniqueness of research problems in think tanks also determine that the evaluation of think tank results cannot rely solely on the establishment of evaluation indicators for quantitative measurement. We should combine quantitative and qualitative evaluation methods and systematically evaluate and investigate from five levels to correctly evaluate the impact, application effect, and contribution of think tank results.

(1) Idea: It should be evaluated with priority whether the think tanks have put forward new concepts, ideas, perspectives,

and strategic recommendations, which have become a general consensus, led the development trend or direction, or become an important scientific basis for national strategies in the research on major issues related to the development of human civilization, the overall economic and social situation, as well as the long-term development of the country. For example, the concept of sustainable development, the contribution of results of think tank problems to the formation of the innovation-driven development strategy, and the strategic judgment that “the world is on the eve of a new round of scientific and technological revolution” put forward in the “Roadmap of Innovation 2050” are becoming global consensus.

(2) Regulation: It is examined whether the results of think tank research serve as scientific basis for the formulation or revision of national laws and regulations, whether the proposed scientific suggestions and forecasts are incorporated into national plans and missions, and whether the developed research methods and tools are commonly used by peers. For example, “Fourteen Opinions of Science”<sup>①</sup>, “The Twelve-Year National Long-term Outline for S&T Development (1956–1967)”<sup>②</sup>, the “Roadmap of Innovation 2050,” the “Vision 2020: Strategic Option of China,” and the Delphi method proposed by the Rand Corporation are the most influential think tank results at the level of regulation.

(3) Institution: It should be examined with priority whether the scientific proposals put forward by think tanks have been adopted by the country or relevant departments or have become important scientific basis for the reform and

**Table 1** Five levels of the evaluation criteria of think tank results

Level	Name	Content
Level 1	Idea	In the research on major issues related to the development of human civilization, the overall economic and social situation, as well as the long-term development of the country, new concepts, ideas, perspectives, and strategic recommendations are proposed, which have become a general consensus, led the development trend or direction, or become an important scientific basis for national strategies.
Level 2	Regulation	Research results serve as scientific basis for the formulation or revision of national laws and regulations; the proposed scientific suggestions and forecasts are incorporated into national plans and missions; the developed research methods and tools are commonly used by peers.
Level 3	Institution	The proposed scientific proposals have been adopted by the country or relevant departments, or have become important scientific basis for the reform and improvement in institution and mechanism.
Level 4	Policy	Studies on key issues related to national economic and social development, national security as well as scientific and technological progress are carried out, and scientific suggestions and forecasts are put forward. Think tanks should serve as the research support for the formulation of relevant policies.
Level 5	Measure	The proposed systematic solutions to major issues in reform and innovation development are adopted by relevant national departments and important regions, and have become important measures and specific actions in reform and development.

① “Fourteen Opinions of Science,” i.e., “Fourteen Opinions on the Current Work of Natural Science Research Institutions by the Party Group of the State Scientific and Technological Commission and the Party Group of the Chinese Academy of Sciences (Draft)” was issued by the CPC Central Committee on July 19, 1961. It was the first national-level comprehensive and systematic regulation on science and technology policy since the founding of the People’s Republic of China, which had an important status and research value in the history of contemporary S&T policy in China. The Chinese Academy of Sciences played an important role in the formulation of the “Fourteen Opinions of Science.”

② In 1956, the CPC Central Committee held a conference on intellectuals and issued a great call for a “march on science.” The CPC Central Committee formulated the first medium- and long-term plan for the development of science and technology in China, namely “The Twelve-Year National Long-term Outline for S&T Development (1956–1967).” Thus, the science and technology in China began to develop under the guidance of the state following the principle of combining prospect programming with short-term plans.

improvement in institution and mechanism. For example, the establishment of the National Natural Science Foundation of China and the Chinese Academy of Engineering, the implementation of the National High-tech R&D Program (“863” program) and National Basic Research Program of China (“973” program), the construction of the national innovation system, and the reform of the S&T planning system have been adopted by the national decision-making departments and have promoted the S&T progress in China.

(4) Policy: It should be examined whether think tanks develop studies on key issues related to national economic and social development, national security, as well as S&T progress, whether scientific suggestions and forecasts are put forward, and whether they can serve as research support for the formulation of relevant policies. For example, the supporting policies of medium- and long-term planning, the policy of deducting research and development expenses, and the policy of reforming three rights of S&T achievements are typical achievements of think tanks that play a role at the policy level.

(5) Measure: It should be examined that whether the systematic solutions proposed by think tanks to major issues in reform and innovation development are adopted by relevant national departments and important regions and have become vital measures and actions in reform and development. For example, the proposal of developing “two bombs and one satellite,” the implementation of major national S&T projects (such as aircraft engines and gas turbines), the construction of comprehensive innovation reform pilot zones, and the implementation of strategic pilot S&T projects are all think tank results in important measures and actions.

### 3 Conclusions and discussion

In this paper, we establish a basic logical system of think tank research based on the theoretical exploration of the purpose, sources and characteristics, and methods of think tank research, as well as the evaluation of think tank research results. Unlike the existing theoretical research on think tanks in the western countries, this research starts from general rules, transcends specific political systems and national contexts, and is not limited in a particular characteristic of think tank research. From the perspective of systems theory, we consider think tank research as a relatively complete and unique research system to explore its original role and characteristics, and then propose the orientations, links, and requirements of think tank research. In a practical sense, the basic concepts and methods for evaluating think tank research results we propose provide theories, methods, and tools for the construction of think tanks in China.

Specifically, one of the main purposes of think tank research in China is to serve the goal of modernizing the governance system and capacity of the country, which also

determines the two sources of think tank problems: decision-making needs and exploration of trends and laws. Unlike the traditional academic research, think tank research converges six characteristics, including interdisciplinarity, interconnection, policy practicability, social impact, innovation, and uncertainty. During think tank research, we should always be under Problem, Evidence, and Science orientations. The DIIS tool proposed in this paper constitutes the four links of think tank research. Meanwhile, we propose that think tank research should adhere to the ideological, constructive, scientific, forward-looking, and independent requirements. The evaluation criteria of think tank results involve five levels: idea, regulation, institution, policy, and measure.

The complicated think tank research, which has a wide range and requires macroscopic strategic thinking, differs from the academic research characterized primarily by microcosmic and deep-going investigation. Thus, expert groups should be organized in the decision-making consultation of think tank research. The specialized talents, focusing on strategies and policies on the basis of academic research, should be trained. The expert groups of think tank research not only include academics but also contain talents with practice and decision-making experience, which is crucial for both the establishment of think tanks themselves and their support for decision-making. In the process of training talents for think tanks, the “revolving door” mechanism will help bridge think tanks and decision-making departments in talents exchange. On the one hand, the talents with in-depth thinking and decision-making experience in certain directions, who have been working in the policy-making departments for a long time, should be attracted to think tanks. On the other hand, the talents trained by think tanks, who have strategic thinking, are transferred to decision-making departments<sup>[21]</sup>.

In prospecting future, on the one hand, the theoretical research on think tank should be committed to providing theory, methods, and tools for the establishment of and research on think tanks. On the other hand, we should try to use emerging technologies to provide new media and methods for think tank research. Meanwhile, the increasingly deep-going and expanded cooperation among think tanks promotes the formation of the think tank network. It has certain influence on the policymaking and international relations of China. It is also a possible research direction to develop studies on some specific practical issues with think tanks as the starting point.

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