

July 2020

Double Helix Structure of Think Tank Research

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Recommended Citation

Jiaofeng, PAN (2020) "Double Helix Structure of Think Tank Research," *Bulletin of Chinese Academy of Sciences (Chinese Version)*: Vol. 35 : Iss. 7 , Article 12.
DOI: <https://doi.org/10.16418/j.issn.1000-3045.20200706002>
Available at: <https://bulletinofcas.researchcommons.org/journal/vol35/iss7/12>

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Double Helix Structure of Think Tank Research

Abstract

As the role of think tanks in the process of advancing the modernization of the national governance system and governance capacity become increasingly prominent, the exploration on the paradigm, theories, and methodologies of think tank research become an important issue. This study raised the double helix structure of think tank research, which is a framework not only to conceptualize think tank research, but also provide practical guidance in conducting think tank research. The outer circulation of the double helix structure conceptualized the research process into question decomposing, interdisciplinary research, and regression to the true question. The inner circulation of the double helix structure is constituted of process convergence method (Data-Information-Intelligence-Solution, DIIS) and logics layer method (Mechanism-Impact-Policy-Solution, MIPS), which target separately at research process and research logics. The internal coupling relationship and the time-space domain are further analyzed. Finally, the theoretical value of the double helix structure of think tank research is raised, which could be considered as a new paradigm in conceptualizing and conducting think tank research.

Keywords

think tank; double helix structure; think tank research; Data-Information-Intelligence-Solution (DIIS); Mechanism-Impact-Policy-Solution (MIPS)

Citation: PAN Jiaofeng. Double Helix Structure of Think Tank Research [J]. Bulletin of Chinese Academy of Sciences, 2020 (07): 907–916.

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Abstract: As the role of think tanks in the process of advancing the modernization of the national governance system and governance capacity becomes increasingly prominent, the exploration on the paradigm, theories, and methodologies of think tank research becomes an important issue. This study raises the double helix structure of think tank research, which is a framework that not only conceptualizes think tank research but also provides practical guidance for think tank research. The outer circulation of the double helix structure conceptualizes the research process into question decomposing, interdisciplinary research, and regression to the true question. The inner circulation of the double helix structure is composed of process convergence method (Data–Information–Intelligence–Solution, DIIS) and logic layer method (Mechanism–Impact–Policy–Solution, MIPS), which separately target research process and research logic. The internal coupling relationship and the time–space domain are further analyzed. Finally, the theoretical value of the double helix structure of think tank research is raised, which can be considered as a new paradigm in conceptualizing and conducting think tank research. **DOI:** 10.16418/j.issn.1000-3045.20200706002-en

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At the end of the 19th century, think tanks arose and developed in Western countries to inform the government on how to improve public policy. Think tanks are defined as “non-governmental and non-profit research institutions independent of stakeholders such as governments, enterprises, and political parties”^[1]. On one hand, think tanks influence decision-making by providing consultation and research services and specialized policy suggestions for policy makers; on the other hand, they impact the public through releasing research results, promoting advanced ideas, and unearthing trends and directions. Therefore, think tanks are becoming increasingly important. They not only link up different policy players, such as the governments, academic institutions, enterprises, and the media but also integrate academic and scientific achievements and public policies and translate the former into the latter.

In recent years, to modernize its governance system and capacity, China has attached great importance to the construction of think tanks and valued the role of think tanks in decision-making. In January 2015, the General Office of the Communist Party of China (CPC) Central Committee and General Office of the State Council of the People’s Republic of China issued the “Opinions on Strengthening the Construction of New Types of Think Tanks with Chinese Characteristics,” setting forth relevant basic principles and goals. It aims to institutionalize the construction of think tanks in

China. In December 2015, China Top Think Tanks Pilot Project was officially launched, with 25 first-batch members. In the report to the 19th CPC National Congress, General Secretary Xi Jinping proposed to strengthen the construction of new types of think tanks with Chinese Characteristics, indicating the nature and pointing out the direction of think tanks in the new era.

As the most important think tank product, think tank research embodying the capability and level of think tanks is the key vehicle for think tanks to exert their influence. Think tank research is not academic research aiming at exploring the unknown and discovering laws, nor is it modern profit-seeking consultation catering to industrial and commercial decision-making. Think tank research is not one-dimensional but multi-dimensional. It targets complex and practical decision-making issues involving the economy, society, environment, science and technology, health care, education, and security. It calls for interdisciplinary perspectives and always exerts extensive and profound influence. Given its importance and complexity of subjects investigated, it is essential to explore the laws, logic and paradigms of think tank research. It is of paramount importance to develop proper research methodologies, tools, and creative research organization modes so as to guarantee that think tank research is objective, professional, independent, and scientific.

Thomas Kuhn^[2], a famous philosopher of science,

Supported by: Major Research Project of the National Social Science Fund of China (NSSFC) (18VZL003)

maintained that a well-established research domain should have its own paradigm and corresponding academic community. A fully-fledged paradigm has its own system, including theory, principle, value, and methodology. It can help researchers shed new light on issues and look ahead into the future. At present, the fully-fledged methods around the world include the Delphi method and technology foresight method. Nevertheless, a paradigm for think tank research is far from being established; a methodology system has not been shaped up, and an academic community upholding an acknowledged paradigm has not been set up. All these will make think tank research less scientific and less specialized, denting think tanks' performance in delivering political consultation and suggestions. This paper is based on long-term practices of think tank research. Insights are gained into the logic of think tanks^[3] and innovation in methodology^[4-8]. Repeated inductions and deductions are conducted to look into the paradigms of think tank research. A double helix structure is proposed for the research purpose of this paper.

The double helix structure must uphold the Problem orientation, Evidence orientation, and Science orientation. It consists of two loop-iteration helix structures, i.e., Data-Information-Intelligence-Solution (DIIS) and Mechanism-Impact-Policy-Solution (MIPS). The double helix structure is a framework that not only conceptualizes think tank research but also provides practical guidance in conducting think tank research. It is an integral system composing outer circulation and inner circulation. The outer circulation refers to the research process of question decomposing, interdisciplinary research, and regression to the true question as well as the foundation of think tank research, i.e., knowledge. The inner circulation comprises the process convergence method (DIIS) and logic layer method (MIPS), which separately target the research process and research logic. The internal coupling relationship is analyzed and the concept of time-space domain is proposed. Finally, the theoretical value of the double helix structure of think tank research is raised, which can be considered as a new paradigm in conceptualizing and conducting think tank research.

1 Double helix structure of think tank research

1.1 Process of outer circulation

In the face of complex and far-reaching think tank problems, it is especially essential to develop think tank research and grasp the relevant overall logic. The development of think tank research actually follows the process logic of question decomposing-interdisciplinary research-regression to the true question, which is called the outer circulation of double helix structure with respect to think tank research. To pursue genuine knowledge and guide practice, think tanks

must play the roles of communication, translation, and feedback between the theory circle and the practice circle (such as politics, commerce, and media). Only in this way can think tank research provide feasible consultation and suggestions for policy making. To this end, the Problem orientation, Evidence orientation, and Science orientation must be upheld. Think tank questions arising in the question decomposing-interdisciplinary research-regression to true question process should be broken down into a series of sub-questions. Then, interdisciplinary research will be carried out on these sub-questions. Finally, regression is made to the true question, and solutions are put forward. The above describes the overall logic of think tank research. Question decomposing, interdisciplinary research and regression to the true question constitute the outer circulation of the double helix structure of think tank research.

(1) Question decomposing: Complex think tank questions are decomposed into a set of clear and operable sub-questions using the decomposed theory and existing knowledge. At this stage, concrete, detailed, and scientific question decomposing will render subsequent research well targeted.

(2) Interdisciplinary research: To address specific sub-questions, specialized researchers with interdisciplinary backgrounds are engaged in data collection, survey, and modeling to discover laws, mechanism, and trends. At this stage, research questions, knowledge, research methods, and research contingents are all interdisciplinary. The existing knowledge, as the basis of the entire research, includes ① knowledge of sciences such as natural science, social science, management science, engineering science, and technical science; ② case studies, tacit knowledge, cognition, and other practical experience; and ③ statistics based on literature, data and statistics available on the Internet and media. It should be pointed out that the thorough research on science knowledge can be regarded as concrete disciplinary research, i.e., academic research in general.

(3) Regression to the true question: On the basis of interdisciplinary research, a series of sub-questions are regressed to the true question to come up with solutions through the loop, iteration, and integration.

1.2 Orientation of outer circulation

The question decomposing-interdisciplinary research-regression to the true question process should stick to the Problem orientation, Evidence orientation, and Science orientation.

(1) Problem orientation: Think tank research should start from questions, take into account their characteristics, and decompose them. One of the characteristics of outer circulation is that it begins with question decomposing.

(2) Evidence orientation: Convincing bias-free facts, scientific evidences and accurate data should be provided. At the regression stage, emphasis is placed on data, facts and evidences so that solutions can be science-supported. That is the Evidence orientation of think tank research.

(3) Science orientation: Scientific laws should be obeyed, and scientific methodology and tools should be adopted to conduct scientific, comprehensive and systematic research. Existing knowledge should be made full use to break think tank questions into sub-questions. Out of the existing knowledge is extracted the knowledge essential for solving sub-questions for interdisciplinary research. All thorough disciplinary research (academic research) reflects the Science orientation of think tank research.

The outer circulation goes through a question decomposing–interdisciplinary research–regression to the true question process. However, as for how to realize the three stages of the outer circulation, answer think tank questions, and produce corresponding schemes, it entails research on inner circulation, including DIIS and MIPS.

2 Process convergence method: DIIS

The author has rich and long-term experience in science and technology strategy research and grand planning. The author also has made systematic summary of the general laws of think tank research. In this context, in terms of research process, the author proposes a DIIS method. In fact, the DIIS method takes into account the whole process of think tank research. It provides comprehensive research ideas and general research flow. In nature, it is a multi-layered and holistic research method. For a complete think tank research process, the first step is to collect all kinds of relevant data (Data); the

second step is to dig, sort out and analyze data to come up with objective understanding (Information); the third step is to introduce relevant scholars and experts' wisdom to come up with new understanding, a new framework and new ideas (Intelligence); the last step is to propose evidence-oriented and scientific solutions pertinent to the raised questions (Solution).

DIIS, which consists of four stages of data, information, intelligence and solution, is a normative research process entailing loop and iteration, i.e., the left-hand helix of the inner circulation (Figure 1).

(1) Data: In line with sub-sets of questions decomposed, relevant data are collected. Data mentioned here are in a broad sense, including data, science knowledge, and practical experience. Internet data, statistical data, image, concept, formula, rationale, case, and cognition can all be considered as data.

(2) Information: The collected data are dug, sorted out, and analyzed to shape a bias-free understanding of things. In nature, it is a process of discovering value.

(3) Intelligence: The wisdom of relevant scholars and experts is introduced to predict the trends of objective cognition to produce consensus, new insight, a new framework, and new idea.

(4) Solution: Based on Steps (1)–(3), solutions, or policy suggestions that meet the demand of actual development are generated. In this way, high-quality and conducive think tank reports can be delivered for macro-decision-making [4–8].

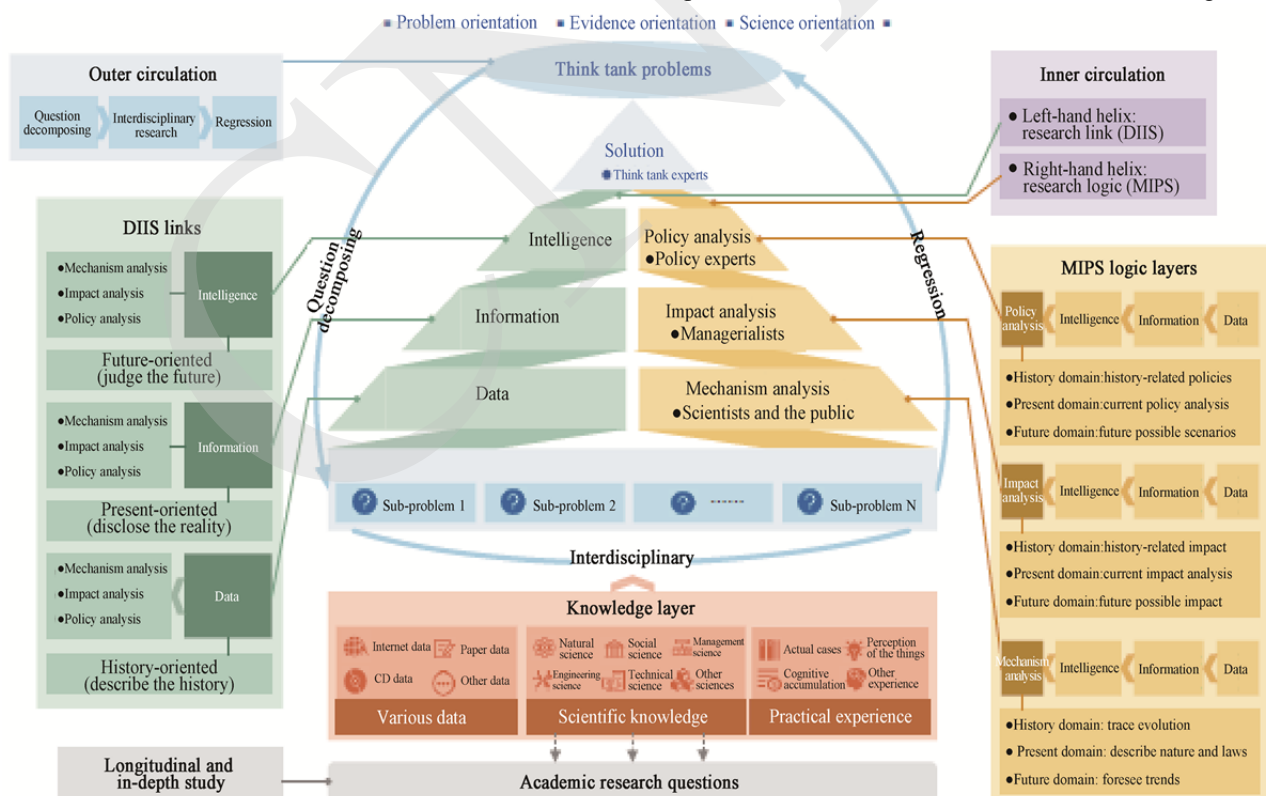


Figure 1 Double helix structure of think tank research

3 Logic layer method: MIPS

Think tank research is a process in which targeted research questions are perceived and predicted. Phenomena and corresponding underlying laws are perceived. Besides, the impacts of phenomena are analyzed and evaluated. Investigation is made into existing policies. Proposal is also made for policy instruments and solutions in the future. Such multi-layered and multi-dimensional systematic research consists of mechanism analysis, impact analysis, policy analysis, and solution. Mechanism analysis is to understand thing-in-itself and its own laws. Impact analysis is to figure out the interaction between thing-in-itself and others to analyze the impact of the thing on other aspects. Policy analysis is to discuss the policy effect of artificial interference or policy regulation. Solution is the product of the above analyses. This method is known as MIPS. It presents the structure of how to make think tank research in the basic logic system of think tank research^[3], offering practical and operational ideas.

From the perspective of research logic, MIPS breaks think tank research down into four layers, namely mechanism analysis, impact analysis, policy analysis, and solution. It is a research process that conforms to cognitive logic and entails loop and iteration, i.e., the right-hand helix of the internal circulation (Figure 1).

(1) Mechanism analysis: For the sub-sets of questions decomposed, relevant data are collected (under the principle of question decomposing, the sub-sets of questions are assigned to various disciplines). On this basis, the sources of questions or corresponding things are traced; their laws are unfolded, and their trends are predicted. The above is known as mechanism analysis, including the following aspects: ① Look back on the evolution of things to unveil the fundamental roots of the questions; ② make interdisciplinary research on relevant data, scientific knowledge, practical experience to discover the nature and the laws of things and make objective judgment; ③ introduce experts' experience and knowledge to make forward-looking foresight of development trends and directions. Scientists of natural science, social science, management science, engineering science, and technical science, as well as the public, can participate in mechanism analysis and play their part.

(2) Impact analysis: One step further upon mechanism analysis is impact analysis. At this level, people observe the changing world in a systematic manner, analyze the potential impacts brought by questions or corresponding things, including the impacts on the economy, science and technology, society, and security. Impact analysis includes the following aspects: ① Generalize the impacts of relevant questions or things; ② analyze the current mutual influence between things and other things around them, for example, the possible positive and negative effects brought by the application of one biological technology; ③ foresee the future mutual

influence between things and things around them, for example, the possible influence of the application of one biological technology on the industry. It is mainly experts of management science who participate in impact analysis and bring their talent into play. Experts of management science conduct impact analysis by applying relevant methods, modifying existing methods or creating new effective methods in line with concrete realities.

(3) Policy analysis: In this stage, policy analysis and judgment of these impacts are made. Policy analysis includes the following aspects: ① Generalize previous policies related to relevant questions or things; ② analyze the interference effect of current policies on questions or things; ③ predict potential policy effects in the future in case that different policy variables are added to questions or things. The backbones of policy analysis are policy experts who make full use of their expertise to analyze the possible effects of policy interference.

(4) Solution: Solutions result from the above analyses and include suggestions for future development direction and priorities and policy measures adopted for think tank questions. Solution providers are visionary and insightful think tank experts with interdisciplinary backgrounds and all-round abilities, who propose strategic and constructive policy suggestions.

4 Internal coupling relationship

Apart from the outer circulation featuring the question decomposing–interdisciplinary research–regression to the true question process, the inner circulation featuring DIIS and MIPS should follow the Problem orientation, Evidence orientation, and Science orientation too. The first link (data) of DIIS and the first logic layer (mechanism analysis) of MIPS start from a sub-set of decomposed questions and then collect relevant data, scientific knowledge, and experience. This is the very embodiment of the Problem orientation of think tank research. Regarding the solution process of DIIS and MIPS, efforts are made to ensure genuine data, bias-free information, specialized intelligence, and prudent and reliable solutions that can provide convincing and bias-free facts, scientific evidence, and data support. That is what Evidence orientation is. Of the four links of DIIS and four logic layers of MIPS, each link or logic layer entails scientific research methodology and instruments and the entire research process calls for interdisciplinary research in line with data collection, scientific knowledge, and practical experience. These aspects fully embody the Science orientation of think tank research.

In the double helix structure, DIIS is process-based; MIPS is logic-based. Nevertheless, DIIS and MIPS are not separate or isolated from each other. Instead, they have a close coupling relationship with each other. They are in a state of

mutual integration, overlapping, loop and iteration, making think tank research highly interdisciplinary.

(1) From the perspective of DIIS links, the internal coupling relationship of DIIS and MIPS is reflected in the following aspects: ① The Data link provides research support for the three logic layers of mechanism analysis, impact analysis, and policy analysis. In other words, the data, scientific knowledge, and practical experience collected in the data link serve as the input of the three logic layers mentioned above, laying a foundation for the analysis on the three logic layers. ② The Information link comprises three elements of mechanism analysis, impact analysis, and policy analysis. In other words, in this link, experts simultaneously make an objective description of laws, conduct an analysis of current influence, and evaluate existing policies. This link stresses the objective and practical nature of questions or things. ③ The Intelligence link also comprises three elements of mechanism analysis, impact analysis, and policy analysis. In other words, in this link, experts simultaneously foresee the trends, potential future influence, and future policy scenarios. This link emphasizes the trends, the prospect and the forward-looking nature of questions or things.

(2) From the perspective of MIPS logic layers, the internal coupling relationship of DIIS and MIPS is reflected in the following aspects: ① In mechanism analysis, the conclusions are reached through continuous loop and iteration of the links of data, information and intelligence. In other words, based on data, science knowledge and practical experience, experts trace evolution, describe objective laws and predict trends in succession to reach conclusions. ② In impact analysis, the conclusions are reached through continuous loop and iteration of the links of data, information and intelligence. In other words, based on data, science knowledge and practical experience, experts investigate the impacts of relevant events, current influence and future potential influence. ③ In policy analysis, the conclusions are reached through continuous loop and iteration of the links of data, information and intelligence. In other words, based on data, science knowledge and practical experience, experts analyze relevant previous, current and future policy scenarios.

5 Concept of the time-space domain

Think tank questions are proposed to understand the status quo and predict the future to serve decision-making. In this sense, an analysis based on a historical view is essential. Academic research aims to describe phenomena and unfold laws, while think tank research aims to address actual problems. This renders think tank research time-space characteristics. In other words, think tank research has to review the past, understand the present, and foresee the future. Important tasks of think tank research are to fully understand the status quo, discover underlying laws, and predict the future.

Regarding the links of DIIS, the first three links, namely,

data, information and intelligence, act on the history, the present and the future, while the forth link, that is, solution, based on the first three links, is the solution geared to the need of the future, including recommended policies, measures, and effect of policies. ① In terms of history, the first link (data) of DIIS is to describe history. Efforts are made to collect various data, scientific knowledge, and practical experience pertinent to think tank questions. ② In terms of the present, the second link (information) of DIIS is to study the status quo and look into the objective and actual nature of things so as to understand the characteristics and unfold the laws. ③ In terms of the future, the third link (intelligence) of DIIS is oriented to the future, highlights the trends of things and predicts the future direction.

Regarding the logic layers of MIPS, the mechanism analysis, impact analysis and policy analysis act on the history, the present and the future, while the Solution link provides the solution geared to the need of the future based on the above three logic layers. ① The three layers of MIPS have effects on history. In mechanism analysis, a review is made on the evolution of things to find out what leads to the question. In this layer, relevant questions or previous impacts are summarized and analyzed. In policy analysis, summary is given to relevant questions or previous policies. ② The three layers of MIPS have effects on the present. In mechanism analysis, interdisciplinary research is conducted on existing knowledge related to questions to unveil the nature and laws of things. In impact analysis, mutual influence between thing-in-self and others is analyzed. In policy analysis, analysis is carried out on the effects of policy interference on questions or things. ③ The three layers of MIPS have effects on the future. In mechanism analysis, the trends and directions of questions under investigation are foreseen. In impact analysis, the future mutual influence between thing-in-self and others is foreseen. In policy analysis, the policy effects on questions or things in future scenarios, in case that different policy variables are added, are foreseen.

6 Discussion

In 1974, in a speech of Paradigm Reconsidered, Kuhn^[2] pointed out that a paradigm is what all members of a scientific community share in common. The consensus includes symbolic summary, metaphysical paradigm, yardsticks for value judgment or theoretical selection as well as paradigms for solving problems. The scientific community follows acknowledged paradigms to conduct scientific research^[9]. Whether think tank research can fully achieve such paradigms remains a mystery. History has proved that the path leading to an acknowledged paradigm is rather tough. The double helix structure of think tank research can be regarded as a systematic and pioneering attempt to explore and identify a think tank research paradigm.

The double helix structure forms integrated and systematic

theoretical frameworks and methodology systems, including the question decomposing–interdisciplinary research–regression to the true question process, DIIS, MIPS, coupling relationship and time–space domain concept. On one hand, the theory of double helix structure expounds on the sources of think tank research from the perspectives of question decomposing, interdisciplinary research and regression to the true question. On the other hand, DIIS and MIPS provide a set of methodologies and operational instruments for carrying out think tank research. More importantly, the theory can provide fresh perspectives and theoretical foundation for how to understand the positioning, function and role of think tank research, how to make think tank research specialized and scientific, and how to systematically organize think tank research. It can solve a series of “puzzles” in think tank research and construction.

(1) How to understand the relationship between think tank research and academic research: The interdisciplinary think tank research targets different types of data, different domains of scientific knowledge and different players of practical experience. Think tank is a platform accommodating different domains of knowledge and experts. It aims to seek systematic solutions for effective communication. In terms of research dimension, it entails mechanism analysis and foresight of different scenarios and policies. Think tank research, in nature, is a kind of interdisciplinary research. Academic research, in contrast, is a kind of thorough exploration of a certain specific discipline. It aims to grasp objectivity, seek truth and explore laws. There is a close connection between think tank research and academic research. As the double helix structure of think tank research indicates, data and information are the main methods for academic research, and mechanism analysis and impact analysis are the main contents of academic research. As the above shows, academic research constitutes the cornerstone and important component of think tank research. High-quality think tank research of decision-making consultation should be based on high-level academic research. Think tank research, first of all, is buttressed by academic research. The absence of academic research equals no think tank research at all. In turn, throughout question decomposing, interdisciplinary research and comprehension of realities in think tank research, new questions, new methods and new ideas will mushroom one after another. This will provide valuable scientific issues for academic research to promote academic research to proceed further and deeper, which in turn will enrich the knowledge basis of think tank research.

(2) How to understand the roles of different scholars in the think tank: Experts’ intelligence is crucial to think tank research. Experts’ extensive disciplines and diverse experience of think tank research are beyond those of academic research and interdisciplinary exchanges. In terms of the logic layers of MIPS, ① mechanism analysis calls for the participation of experts from fields of natural science, social science, management science, engineering science, and technical science.

The laws are understood and the trends are predicted from the perspectives of different disciplines. ② As for impact analysis, experts of management science look into the impacts of questions of concern on the economy, society, science and technology, livelihood, health, and security. Not only qualitative judgment but also quantitative measures are imperative. ③ Regarding policy analysis, policy experts study what impacts existing policies will bring, the knotty aspects of policies, the adaptability, how to design new policies for different contexts, and how to undertake policy simulation among other things. Think tank research brings the wisdom of think tank experts, policy experts, experts of management science, scientists, and the public into play. In this sense, the integration nature of the think tank is further confirmed.

(3) How to carry out the specialty construction of think tank: Think tanks should enhance their specialty, including the following aspects: ① Specialized think tank talents A state-of-art think tank should boast experienced, insightful and discerning talents, who see through the surface to grasp the nature of things, lead experts to apply their intelligence to problem solving. ② A high-caliber and interdisciplinary research contingent A sophisticated think tank should be equipped with an interdisciplinary contingent of talents, who adopts systematic organizational approaches to cope with complex problems. Besides, it goes through a scientific and standard flow to break complex problems down into detailed and targeted science problems, addresses these problems, and pools the wisdom to identify approaches to tackle the complex problems, thus providing forward-looking, strategic, systematic, and operational solutions. ③ Specialized research methodologies and tools A high-quality think tank is inseparable from creative research methodologies and tools, such as methods for data collection and analysis, expert screening, and policy modeling. More advanced techniques and more exquisite data modeling are employed to regress to the true question and predict trends, thus making think tank research more specialized and scientific.

(4) How to position think tank: The double helix structure targets think tank research. It is based on plentiful cases and much organization experience of think tank research. It entails repeated induction and deduction and systematic consideration of research paradigms. Theoretically, it is conducive to propelling think tank to address complex research problems, building a diversified research contingent and exerting influences in multiple aspects. Think tanks should be better positioned. As can be seen from the double helix structure, think tank research refers to specialized research based on concrete disciplines. Moreover, it is a kind of integrated undertaking targeting problems and pooling experts’ wisdom. Above all, it is a kind of systematic and engineering organizational endeavor.

Think tank highly integrates natural science and social science. Think tank itself is a kind of constantly upgraded grand learning. Its research scale, scope, vision, and insight are incomparable. People are marveled at its integrating

empirical science, policy science, and emerging sciences. Innovative and scientific think tank achievements cannot be made unless no efforts are spared to explore laws and develop new theories, coupled with advanced academic research and scientific methods and tools.

Acknowledgements

This paper is a product of long-term think tank practical experience and deliberation. Gratitude is extended to Zhang Feng, Yang Guoliang, Chen An, Lu Xiao, and Liu Huihui from the Institutes of Science and Development, Chinese Academy of Sciences for their contributions.

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(Translated by WEN JX)



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