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Abstract

The rapid accumulation of data resources and the development of analysis technologies have expanded the scope of think tank research, and prompted think tanks to pay more attention to data intelligence. Meanwhile, higher requirements are put forward on the quality and innovation of the think tank. Facing the development needs of think tanks, i.e., modernization, innovation, and conscientization, this paper demonstrates the change of data-driven think tank researches from the perspective of the information chain. The paper analyzes the urgent need to reshape the discursive logic of the think tank, and discusses the construction scheme of triangulation for data-driven think tank research. Finally, several suggestions for optimizing the construction of think tanks are put forward, such as paying attention to the complementarity of correlation and causality, integrating the technical rationality and humanistic values, analyzing from the perspective of cyber-physical-human ternary space, seeking support from multidisciplinary knowledge, and constructing the engineering services of the think tank.

Keywords

think tank, data-driven, discursive logic, triangulation, information chain

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Thoughts on Data-driven Discursive Logic and Triangulation of Think Tank

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Abstract: The rapid accumulation of data resources and the development of analysis technologies have expanded the scope of think tank research, and prompted think tanks to pay more attention to data intelligence. Meanwhile, higher requirements are put forward on the quality and innovation of think tanks. Facing the development needs of think tanks, i.e., modernization, innovation, and scientization, this paper demonstrates the change of data-driven think tank research from the perspective of the information chain. The paper analyzes the urgent need to reshape the discursive logic of think tanks, and discusses the construction scheme of triangulation for data-driven think tank research. Finally, several suggestions for optimizing the construction of think tanks are put forward, such as paying attention to the complementarity of correlation and causality, integrating the technical rationality and humanistic values, analyzing from the perspective of cyber-physical-human ternary space, seeking support from multidisciplinary knowledge, and constructing the engineering services of the think tank. DOI: 10.16418/j.issn.1000-3045.20211130003-en

Keywords: think tank research; data-driven; discursive logic; triangulation; information chain

As a bridge connecting diverse subjects in the policy space, think tanks fulfill the commitment to provide professional policy-related suggestions for the state and influence government decision-making, and also lead the public to the knowledge on policy-related concept and ideas^[1]. In 2016, General Secretary Xi Jinping noted at a symposium on philosophy and social sciences that think tanks should focus on how to carry out high-quality research and advance content innovation. That is, we need the think tank products and services that adapt to the trend of economic, social and technological development, and feature both scientific innovation and international influence. This goal becomes the momentum to promote the modernization, innovation, and scientization of think tanks.

From the perspective of information chain, data serve as the underpinning for think tank research. The environment and technology of big data not only ensure the availability of massive data resources and analysis techniques but also facilitate the sustained development of the data-driven think tank research. The data-driven think tank research focus on fostering stronger decision-making support and public guidance through integrating, analyzing, and using multi-source heterogeneous data. In this process, the discursive logic of think tanks, i.e., how to express and present the research results, bridges between the data and think tank services. In other words, whether the discursive logic of think tanks can adapt to the decision-making and information needs of diverse subjects in the environment of big data will directly shape the service quality of think tanks. Additionally,

how to reach scientific, robust, and objective conclusions of data analysis so as to support the discursive logic and assist government decision-making has also emerged as a key factor for the quality of think tank research. Therefore, this paper analyzes the urgent need to reshape the discursive logic of the think tank, and discusses the construction scheme of triangulation for data-driven think tank research, aiming to providing suggestions for optimizing the data-driven think tank research from the perspective of data management and service.

1 Changes of data-driven think tank research

1.1 Mutual development of think tank research and data analysis

There exists a natural connection between think tank research and data analysis.

(1) The accumulation of high-quality data secures the quality of think tank research. Think tanks carry out analyses based on comprehensive and self-built distinctive data resources to provide reliable support for decision makers. As data resources underpin think tank research, the accumulation of data resources and related elements will work on the extent and depth of the research. Effective decision-making support is built on the full understanding, analysis, and interpretation of the target issue, in which massive data resources become necessary. In other words, the

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magnitude, standardization, and quality of available data can determine the scope of think tank research and work on the perspective of think tank analysis and the precision of data analysis, thus shaping the quality of the products from think tank research.

(2) Think tank research serves as a major orientation of data analysis. Data analysis is not to build a mere form. Only the analysis that is conducted in specific context or oriented to particular issues can unleash fully its potential and value. Particularly in the new context where big data analysis widely prevails, only in specific scenes and fields can big data analysis become targeted and effective. As think tank research generally deals with the issues related to public policies and strategies, the relevant efforts had the attributes of both research and application^[2]. The data analysis oriented to think tank research, for one thing, can support the quantitative research to make the research results significant in both theoretical and practical terms, and for another, can serve science and technology management and decision-making for social activities to achieve the application of research outcomes in the real world.

(3) Think tank research and data analysis show spiral co-existence. Rather than independent of each other, the research and data analysis of think tank have become increasingly inclined to mutual support and development. The former makes the latter practically relevant, while the latter does not only represent a key means but also advance the innovation of think tank research. In the era of big data, particularly, a large number of think tanks have grown self-motivated to build up data accumulation and advance the building of the data resources with their own characteristics. Meanwhile, data analysis method has also been widely adopted by think tank services, which has prompted the rapid application and value communication of data resources.

1.2 Data-driven think tank research from the perspective of information chain

Information chain is generally composed of fact, data, information, knowledge, intelligence, and wisdom. As a continuum, it presents a full picture of how facts are cognized and utilized by human beings^[3]. Specifically, the data-information-knowledge-wisdom (DIKW) model has been widely accepted in the academic community to reveal the track of evolution and transformation from data to decision-making process. In addition, it also represents a dynamic process of data use in decision-making analysis. Correspondingly, Pan^[4] proposed a three-dimensional theoretical model (DIIS) of think tank, which abstracts the process of think tank research into four links: data, information, intelligence, and solution. In terms of bottom-level logic, DIIS model is consistent with the analysis of the transformation path from knowledge to wisdom by information chain. That is, think tank research also approaches from data before

forming the solution to the target issues through the processing and refining of data. For this reason, information chain can reflect the process of think tank research at the data level. Additionally, as the information chain shows the process of evolution, discussing data-driven think tank research from the perspective of information chain represents a theoretical implication that reveals how the changes of data and technical environment impact the path and mode of think tank research.

The recent years has witnessed significant changes in the data and technical environment for research. As to data resources, small data used in traditional research are giving way to big data and even smart data. In terms of information technology, emerging information technologies such as big data, artificial intelligence, cloud computing, and the Internet of Things have experienced sustained development and been widely used as solutions to relevant research tasks. These changes have directly led to the cross-level links among the elements in the information chain. The changes in data resources and information technology have brought an end to the single path of the traditional information chain DIKW, enabling the two bottom-level elements—data and information—to directly generate wisdom. In other words, the mere analysis of massive data can reveal the wisdom that previous studies need to obtain through tedious induction and deduction. Such being the case, researchers have begun to approach from the data and explore the link between research objects via new data analysis techniques, aiming to identify the potential patterns and characteristics of these objects and thus enabling the rise of data-driven research^[5]. With the relevant research, any fact that is difficult to quantify in traditional research can be captured by big data and its relevant analysis techniques, which will optimize or even subvert the traditional research mode while expanding the scene and scope of the disciplinary research.

The changes in technical and data environment have encouraged the transformation of think tank research from single expert insight to comprehensive data insight, and the gradual formation of data-driven research mode. As the extension of theory-driven research, data-driven think tank research is all about exploring the internal patterns between data via the technical means such as big data and cloud computing, thus providing support for decision makers^[6]. (1) Mode of think tank research. The cross-level skip directly from data to wisdom has lessened subjective intervention of experts in the think tank research and fundamentally changed the mode featuring the strong dependence of traditional think tank research on experts' wisdom and experience. In addition, the data-driven mode has inspired a series of new thinking in think tank research, such as correlative thinking, computing thinking, engineering thinking, cross-disciplinary thinking, and space-time thinking, further advancing the transformation of think tank research. (2) Building of think tanks. As

fast appreciation make data the core resource of think tanks, building a complete data support system has emerged as a key goal of well-known think tanks. For instance, amid the commitment to building a data-driven think tank, the RAND Corporation of the United States has built a wide-ranging data system, a project data system, and a comprehensive two-way participatory data system [7].

2 Re-shaping of the discursive logic of think tank amid data transformation

2.1 Components of discourse system of think tank

The discourse system of think tank represents an expression system formed by the think tank in its provision of decision-making services, which interacts frequently with policy discourse, academic discourse, and media discourse.

(1) The discourse of think tank needs to carry on the policy discourse, and thus the think tank research calls for the understanding of the connotation of policy, and targeted response and extension. As think tank research mainly serves to support decision-making, the policy discourse can well convey the research results and identify the research value of think tanks.

(2) Academic discourse secures the commitment to improving the cognitive authority of think tank products and encouraging the international exchanges. Reliable and scientific think tank research depends on the discourse expression system of academic research. Profound and standardized academic research is not only a major basis for the market popularity of think tank products but also the logical underpinner for open exchanges. Compared with dialogues between policies or negotiations between enterprises, the discourse system of think tank compatible with academic discourse will become more inclined to cross-border communication and international exchanges.

(3) The discourse system of think tanks needs to act as a bridge between the government and the public. Think tank discourse needs to not only collect the shared aspiration of public discourse but also spread the media discourse that is easily adopted by the public. Particularly in the context of new media, how to make the results of think tank research easy to understand and acceptable to the public is of great importance to improving the social influence of think tanks and the quality of their services.

To this end, this paper holds that the discourse system of data-driven think tank research should be compatible with the media discourse applicable to communication with the public, on the basis of policy and academic discourses, so as to enhance the public communication power and influence on decision-making of think tank research (Figure 1).

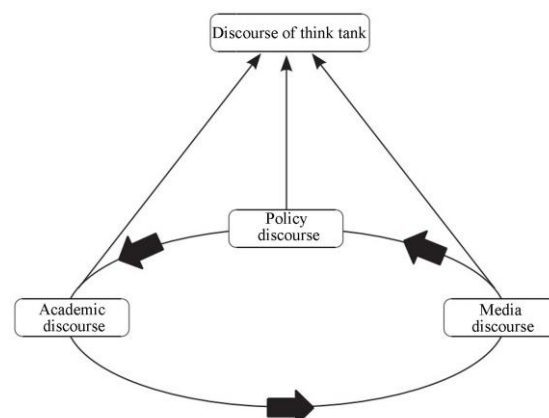


Figure 1 Discourse system of think tank

2.2 Correlations of think tank discourse clues

In addition to the building of a discourse system adapted to the environment of big data, the value of think tank cannot be separated from the effective correlation of discourse clues. In other words, whether discourse clues can be well correlated will directly affect the acceptability and influence of the outcomes of think tank research. Facing the modernization, innovation, and conscientization of think tanks, this paper puts forward that the correlations of think tank discourse clues mainly involve the following three aspects.

(1) The integration of self-source discourse and other-source discourse. As a decision-making supporter and public guider, think tank should, by upholding its commitment to inclusiveness, examine the correlation between self-source discourse and other-source discourse, and compare and verify the confidence of different research conclusions by using massive data resources and new analysis techniques, thus forming scientific and systematic correlations of discourse clues.

(2) The integration of policy discourse and academic discourse. Think tank researchers usually have different cognition and expression patterns from their recipients. While weakening the subjective involvement of experts, data-driven think tank research increases the difficulty in the correlation between policy discourse and academic discourse. Therefore, it is necessary for the discursive logic of think tanks to adopt big data analysis in the correlation between contextual policy-related knowledge and conceptual academic knowledge, thus contributing to the integration of policy discourse and academic discourse.

(3) The integration of policy discourse and media discourse. Think tanks not only serve policy makers but also play a role in guiding the public. As an effective enabler for the exchanges between decision-making and the public, media has also, particularly amid the wide use of new technologies and new media in the context of big data, brought decision-makers, think tanks, and the public closer than before. Accordingly, think tank should make targeted efforts to

reduce the mismatch between discourse systems and enhance the spreading of the research outcomes by building relevant agenda networks and reshaping media discursive logic.

3 Building of the triangulation system oriented to the reshaping of discursive logic

3.1 Dilemma facing data-driven think tank research

With profound influences on the thinking, technology, and process, big data have spurred great changes of think tank research. The data-driven think tank research, however, has taken on many problems in specific practice, which leaves the scientific basis and reliability of the research outcomes yet to be verified. The common dilemmas facing data-driven think tank research mainly involve the following two aspects.

(1) Think tank research overemphasizes quantitative analysis process rather than the reliability of results. At present, the quantitative studies titled index, competitiveness, big data analysis, and top-100 list are ubiquitous in think tank research, which aim to reflect the variations and development characteristics of relevant issues or phenomena through quantification and data analysis. However, some studies do not conduct systematic survey of the background and relevant demand before the research, leaving the research conclusions superficial. Additionally, due to insufficient data, the studies about the same issue sometimes give different conclusions. These problems are rooted in the lack of overall perspective as manifested in the excessive reliance on the results generated by small-scale or specific-field data resources, as well as the excessive attention to the theoretical self-consistency with no regard to the demonstration of research conclusions in multiple dimensions and the in-depth understanding of objective reality. This dilemma can be summarized as the excessive use of academic discourse in think tank discourse.

(2) The outcomes of think tank research are in the reproducibility crisis. A survey of *Nature* has reported that a large number of researchers believe the existence of reproducibility crisis in scientific research^[8]. Similarly, Serra Garcia and Gneezy^[9] also confirmed low reproducibility of psychological and economic studies. For research institutions as the major force of think tank research, repeatability crisis will also affect the robustness of the results of data-driven think tank research. The crisis may be associated with the rationality, scientific basis, and confidence of the data^[10].

The above-mentioned two dilemmas represent the knock-on effects due to the incompleteness, unreliability and inaccuracy of the data and data analysis. Accordingly, it is suggested to construct a triangulation system based on triangulation of data, and combine different data and methods according to certain principles to ensure the quality of think tank research outcomes.

3.2 Triangulation improves the outcomes of think tank research

Triangulation, originating from social sciences and pedagogy, highlights the integration rather than simple superposition of core elements such as theory, data, and method in research. Unlike many existing studies, triangulation highlights the integration for resolving a research problem. Specifically, the integration of different elements does not mean the loss of their own characteristics, but reflects or solves the target problem from different perspectives. Triangulation aims to overcome the bias caused by a single element so as to improve the reliability of research findings. It is mainly classified as data triangulation, investigator triangulation, theory triangulation, and methods triangulation^[11].

The discursive logic of data-driven think tank research is designed to foster the integration of policy, academic and media discourses, and correlate the targeted discourse clues for the target recipients, thus maximizing the value and increasing the influence of think tank research. However, the construction of discursive logic of think tank is subject to the generation of consistent, forward-looking, and falsifiable results of data analysis. In other words, a scientific and systematic triangulation system should be built to ensure the validity of the results of think tank research. As aforementioned, triangulation can verify the scientific basis, objectivity, and universality of the research results from multiple perspectives. Therefore, this paper holds that we can build a triangulation system (Figure 2) to improve the outcomes of think tank research.

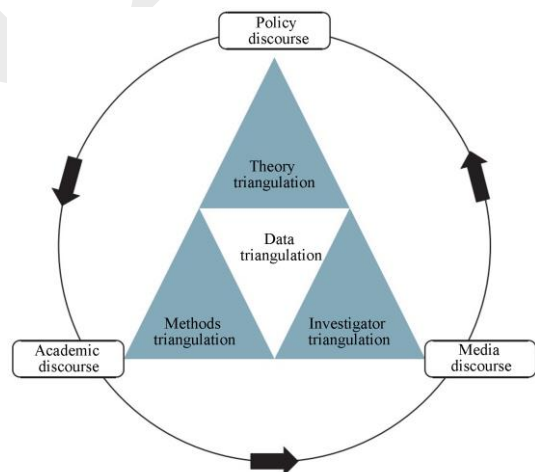


Figure 2 Triangulation system of think tank

Specifically, the construction of triangulation system of think tank research needs to be based on data triangulation, with regards to theory triangulation, method triangulation, and investigator triangulation.

(1) Data triangulation. Think tank research should, with emphasis on the universality and diversity of data information, adopt the “self-built data + external data” model. The triangulation of the same issue with varied data can maximize

the authenticity and effectiveness of the research conclusion. In this process, the difference in data is reflected in the different sources rather than the varied generation methods. In other words, data triangulation can be achieved by changing the time, scene, and object of data acquisition. As for think tank research, accumulating massive data resources and building a corresponding data support system is a premise for data triangulation.

(2) Theory triangulation. The data analysis and interpretation of think tank research should be based on diverse theories and from many perspectives, so as to overcome the interpretation-related bias. Carrying out model construction and result verification from the perspective of similar or dissimilar theories can reveal data characteristics or verify the stability and consistency of analysis results in different dimensions. For the fields featuring low theoretical consistency, in particular, theory triangulation can improve the robustness of results.

(3) Method triangulation. The integration of quantitative and qualitative methods should be valued in think tank research. Method triangulation includes intra-method triangulation and inter-method triangulation. The former concerns the triangulation between the same type of methods, while the latter focuses on the differences in the research results obtained by different types of methods. The operation principles vary between quantitative and qualitative methods, based on which the method triangulation in think tank research can enhance the robustness and reliability of the research conclusions.

(4) Investigator triangulation. More participants can be invited to grasp the overall picture from multiple perspectives, thus avoiding any omission in problem detection. Inviting different observers and interviewers to the same research can help minimize the bias among investigators, thus ensuring the universality of research conclusions.

4 Reflection and outlook of think tank construction in a data-driven context

Focusing on the needs in think tank research and construction in the data-driven context, especially the optimization of discursive logic and triangulation system, this paper puts forward five suggestions concerning think tank construction.

(1) Paying attention to the complementarity of correlation and causality. As the “causal revolution”^① is sweeping all the fields of research, think tank as a brainpower should make to efforts to mine the internal causes and generation mechanism of the relevant issue. Therefore, we can adopt the “correlation + causality” mode to carry out triangulation, so

as to decipher the internal mechanism of the development of things, thus steering think tank research towards the real world.

(2) Integrating the technical rationality and humanistic values. In the context of new technology, data-driven think tank research takes on an obvious technical attribute. How to rise above this technocracy prevailing in the modern world, couple technology with the issues and needs concerning social governance, and highlight the humanistic values represents a key issue for think tank research and services.

(3) Analyzing from the perspective of cyber-physical-human ternary space. Human social activities are carried out in physical space, social space, and information space (ternary world), amid the development of information technology. The growing data flow and dramatically increasing data volume contribute to ever-frequent interactions between physical world, human society, and cyber space. For this reason, the data in different spaces may involve the same focus of research. Conducting data triangulation from the perspective of cyber-physical-human ternary space may shed new light on think tank research.

(4) Seeking support from multidisciplinary knowledge. As the knowledge in a single field can hardly deal with complex problems concerning science and application in the era of big data, it is required to integrate cross-disciplinary knowledge to better support think tank research. Specifically, we should promote the adoption of workshop mechanism and build a longer knowledge chain to ensure relevant support. Further, it is suggested to advance the building of method pool and data pool or distinctive database. Finally, efforts should be made to carry out system planning and design, and implement the target-oriented management responsibility mechanism of data system building.

(5) Constructing the engineering services of think tank. Data-driven think tank research should ensure the comprehensive balance of input and output in the triangulation system. Establishing an integrated, coordinated, and systematic engineering services via a coordinated service platform will improve the efficiency and performance of think tank research.

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