Postprint: An Open Source Intelligence Evaluation Framework Based on International Think Tanks

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Abstract

[Purpose/Significance] Evaluation constitutes the foundation of open-source intelligence (OSINT) operations. International think tanks, serving as a significant source of OSINT, have yet to receive due attention, with theoretical research trailing practical demands. Establishing research on OSINT evaluation within the think tank domain aims to provide theoretical supplementation to OSINT research in this field and furnish references for OSINT practice concerning think tanks. [Method/Process] From the perspective of intelligence collection, this study employs deductive reasoning to demonstrate that openness is a critical prerequisite for international think tanks to function as OSINT sources. Building upon this foundation and integrating the distinctive characteristics of international think tanks, we inductively identify the principal attributes of OSINT from international think tanks: professionalism, policy relevance, early warning capability, evidentiary value, and data utility, thereby furnishing a theoretical basis for OSINT evaluation. Furthermore, by drawing upon evaluation methodologies from NATO systems, we construct an evaluation framework for OSINT derived from international think tanks. [Results/Conclusion] Within this framework, intelligence personnel and domain experts must collaborate as joint evaluation subjects. The evaluation objects should encompass both intelligence source assessment and intelligence content assessment. Source evaluation should prioritize think tank professionalism, independence, and credibility, while content evaluation should focus on eight elements: authenticity, completeness, timeliness, predictiveness, practicality, counter-intelligence characteristics, comprehensibility, and traceability.

Full Text

Preamble

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Research on an Evaluation Framework for Open Source Intelligence from International Think Tanks

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Abstract:
[Purpose/Significance] Evaluation forms the foundation of open source intelligence work. Although international think tanks represent an important source of open source intelligence, they have not received adequate attention, with theoretical research lagging behind practical needs. This study establishes an evaluation framework for open source intelligence in the think tank domain, aiming to provide theoretical supplementation for research on open source intelligence from think tanks and offer references for practical open source intelligence work in this field. [Method/Process] Focusing on the intelligence collection perspective, this paper uses deductive reasoning to demonstrate that open source nature is a crucial prerequisite for international think tanks to serve as sources of open source intelligence. Based on this foundation and combined with the inherent characteristics of international think tanks, it identifies the main features of open source intelligence from international think tanks: professionalism, policy-orientation, early warning capability, evidentiary value, and data value. These features provide a theoretical basis for open source intelligence evaluation. Drawing on NATO system evaluation methods, the paper constructs an evaluation framework for open source intelligence from international think tanks. [Result/Conclusion] In this evaluation framework, intelligence personnel and domain experts must collaborate as joint evaluators. The evaluation objects should encompass both intelligence source assessment and intelligence content assessment. Source evaluation should focus on think tank professionalism, independence, and credibility, while content evaluation should examine eight key elements: authenticity, completeness, timeliness, predictability, practicality, counter-intelligence considerations, understandability, and traceability.

Keywords: international think tanks; open source intelligence; intelligence sources; intelligence evaluation; Brookings Institution; think tank communication
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1. Research Questions

With the deepening development of internet information technology, contemporary society has become increasingly "open," creating a wealth of open information sources that have fundamentally transformed intelligence work models. Obtaining intelligence from publicly available information has become the primary focus of intelligence collection, and open source intelligence (OSINT) work is on the rise. Initially oriented toward national security and strategic services, OSINT is commonly understood in both narrow and broad senses. The narrow definition confines itself to open sources and content, while the broad definition additionally emphasizes the openness of the intelligence process itself [1]. Various important institutions such as the U.S. Congress, CIA, NATO, and related experts have offered different interpretations of OSINT. Although no unified definition has emerged, they share essential commonalities in viewing OSINT as the utilization of publicly accessible information to address intelligence requirements.

This understanding reveals that intelligence sources hold significant importance in OSINT work. Compared with traditional clandestine intelligence, OSINT emphasizes "openness" primarily to highlight the public availability of sources. According to the DIKI (Data-Information-Knowledge-Intelligence) theory in information studies, the information chain progresses sequentially from data to information to knowledge to intelligence [2]. Intelligence is a product formed through a series of collection, processing, refinement, and analysis procedures applied to raw data. Therefore, open source data marks the beginning and origin of OSINT, generally referring to publicly available, raw, unprocessed primary materials such as an article, a radio program, or an oral statement. While such data may appear meaningless or valueless individually, when processed and integrated, they can generate substantive information with intelligence value, which can further be transformed into intelligence products with appropriate knowledge contextualization.

The vast array of open source data offers substantial advantages to OSINT, making its formation process generally characterized by low cost and high benefit. The value of OSINT in contemporary intelligence work has become increasingly prominent. Numerous studies have revealed that OSINT constitutes a significant proportion of modern intelligence work. Former CIA Director Allen Dulles's proposed "80% rule" represents the earliest quantitative assessment of OSINT, suggesting that open sources account for 80% of the intelligence needed by governments [3], a figure frequently cited since. This perspective has permeated multiple industries and sectors. For instance, R.W. Winks noted that 90% of foreign intelligence obtained came from open sources [4]; similarly, researchers in enterprise information management believe that 90% of competitive intelligence information can be acquired through public data [5].

However, OSINT does not exist in isolation within the broader intelligence system. It intersects with and even permeates the workflows of other intelli-

gence types, including geospatial intelligence, human intelligence, signals intelligence, and imagery intelligence. Moreover, OSINT facilitates the acquisition of other intelligence types, particularly by providing entry points for obtaining non-public intelligence sources.

While OSINT has become a long-term, important direction for intelligence work, it also faces numerous challenges, particularly regarding the classification and definition of "open source" objects, which determines the scope of OSINT work. Existing classifications are primarily based on OSINT source channels. Notable examples include the U.S. Army's classification of sources into academic institutions, government and non-governmental organizations, libraries and research centers, commercial or public information organizations, and individuals and groups [6]. Additionally, the RAND Corporation categorizes information sources by content form into four types: news media sources (newspapers, journals, television, radio, etc.), gray literature sources (publications from non-media institutions), long-form social media sources (blogs), and short-form social media sources (Twitter, Facebook, etc.) [7].

Faced with diverse intelligence sources, identifying reliable sources and obtaining timely, effective information constitute the key to OSINT. Professional institutions with open source attributes can play crucial roles in this regard. International think tanks, as professional decision-making consultancies, not only possess specialized knowledge and rich intellectual resources but also maintain diverse information dissemination channels—including publications, websites, and social media—while establishing extensive social communication networks. These attributes grant them natural advantages as public information sources. According to the 2020 Global Go To Think Tank Index Report, approximately 8,248 think tanks exist worldwide [8], engaged in public policy research across different domains, representing a significant global phenomenon. Leveraging the vast amount of public information generated by this extensive think tank community provides new approaches for OSINT work, particularly in an era of intensifying great power competition where international think tank institutions may become important sources for obtaining international community intelligence, offering more reliable source support for OSINT work.

Some countries have already taken corresponding actions in practice. For example, Russia previously listed think tanks as important sources for intelligence collection in pursuit of economic development [9]. China's intelligence work has also increasingly emphasized intelligence analysis derived from international think tanks, with relevant intelligence agencies organizing professionals to collect, organize, and compile research information from foreign think tanks on China-related issues, providing intelligence support for national strategy and foreign policy formulation. Particularly in the field of scientific and technological intelligence, some research teams have established specialized tracking and collection mechanisms for international think tank outputs on specific themes and topics.

However, due to theoretical research lagging behind practical demands, domes-

tic researchers currently focus primarily on learning from experience, drawing lessons, and conducting comparative studies of international think tanks, without yet paying adequate attention to their OSINT value. This theoretical gap not only fails to support relevant OSINT practices but may also constrain their development. Addressing this phenomenon, this paper focuses on the source perspective of OSINT to address two key questions: (1) Why can international think tanks serve as sources of OSINT? (2) How should OSINT obtained from international think tanks be evaluated, given that evaluation forms the foundation of OSINT work? Centered on these questions and combined with the characteristics of international think tank development, this paper uses deductive reasoning to demonstrate the feasibility of obtaining OSINT from international think tanks. Since openness is the prerequisite for OSINT work, the open source nature of international think tanks constitutes the foundation for OSINT operations. On this basis, the paper analyzes the value characteristics of OSINT from international think tanks to provide a basis for evaluation, and constructs a theoretical evaluation framework for OSINT from international think tanks, offering beneficial theoretical supplementation for OSINT research in the think tank domain while providing corresponding references for OSINT practice.

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2. Related Research Status

2.1 Research Status on Think Tanks and Intelligence

Historically, think tank institutions have maintained deep connections with intelligence since their inception. Given the broad connotation of intelligence agencies in China, think tank research has become a disciplinary growth point in the field of library and information science in recent years, with research on the relationship between think tanks and intelligence gradually increasing. These studies can be basically divided into two types.

The first type involves comparative research aimed at analyzing the logical relationship between think tanks and intelligence research. Unlike the clear distinction between think tank work and intelligence work abroad, domestic research generally believes that the two share both differences and connections. In terms of differences, the core of intelligence research lies in data collection, analysis, and quantitative processing, whereas the core of think tank research is policy analysis and consultation based on data and facts [10]. Intelligence research tends to emphasize the roles of “eyes and ears” and “vanguard,” with weaker “advisory” functions [11], which constitute the core of think tank work. Even when intelligence research provides decision-making consultation services, it differs from the policy consultation offered by think tanks in the public policy domain [12]. Through comparative studies, researchers have confirmed that differences indeed exist between the two, though these differences are sometimes not obvious, resulting in blurred boundaries. The demarcation primarily depends on the level of intelligence services. For instance, Chen Feng [13] argues

that the value of intelligence services increases sequentially across four levels: information services, intelligence services, management decision-making consultation services, and intellectual wisdom services. Similarly, Li Lin [14] divides intelligence into three levels: tactical, operational, and strategic. From this perspective, think tank research represents an extension of intelligence research, with high-level intelligence services capable of performing think tank functions.

The second type involves integrative research, where think tank work and intelligence work intersect and complement each other. On one hand, think tank work cannot be separated from intelligence services [15], and library and information institutions can provide more professional support in this regard. Consequently, researchers in library and information science have conducted extensive discussions from multiple perspectives, including the advantages and disadvantages of library and information institutions' participation in think tank services [16], pathways [17], and innovative service mechanisms [18]. As research deepens, the focus has shifted from establishing cooperation mechanisms between think tanks and intelligence agencies [19] to promoting integration between intelligence agencies and think tank institutions [20] and achieving transformation into think tanks [21-22]. On the other hand, the product production process of think tanks itself encompasses specific intelligence analysis work. For example, Ding Lulu et al. found through interviews that structured knowledge presentation, subjects and objects of intelligence analysis, and institutional introspection dimensions [23] all influence think tank intelligence work. Other studies have analyzed specific cases of international think tank institutions, such as RAND Corporation [24] and the U.S.-China Economic and Security Review Commission [25], to examine how think tanks acquire and utilize intelligence in their research. Additionally, applying intelligence analysis techniques to think tank evaluation has gained popularity. From the perspective of intelligence researchers, intelligence thinking, methods, and tools should permeate the entire think tank evaluation process, with intelligence value guiding the evaluation orientation [26]. Both individual researchers and third-party research institutions have established think tank evaluation indicator systems from different perspectives, including comprehensive capabilities, influence, communication power, competitiveness, and media ecology, which have been reviewed extensively elsewhere and need not be repeated here.

In summary, researchers have explored various issues related to think tanks and intelligence research from multiple perspectives based on their intricate connections and domain-specific knowledge. However, although the intelligence function of think tanks has attracted some researchers' attention, existing studies have primarily focused on the intelligence input direction of think tanks—that is, how think tanks capture intelligence from external sources or how external parties proactively provide intelligence to think tanks. Scant attention has been paid to the intelligence output direction of think tanks—that is, how think tanks provide intelligence externally or generate intelligence value. The latter constitutes the focus of this study.

2.2 Research Status on Open Source Intelligence Evaluation

Due to the diversity of OSINT sources and low access barriers, the accuracy, reliability, and value of intelligence sources vary considerably, making source evaluation critically important in OSINT work. Reliability has become the focal point of public intelligence source evaluation. Zhao Xiaokang et al. [27] argue that reliability encompasses both information authenticity and professionalism, proposing four indicators for source evaluation: formal characteristics, organizational characteristics, link characteristics, and value characteristics. Since OSINT represents a special type of intelligence source, its evaluation follows both general principles of intelligence source evaluation and exhibits variations according to specific domains. In the field of scientific and technological frontier intelligence, Zeng Wen et al. [28] established an evaluation system for open source data value comprising three primary indicators and eight secondary indicators: basic characteristics (authority, influence, attention), content characteristics (domain relevance, completeness), and frontier characteristics (timeliness, novelty, interdisciplinary nature). In the domain of documentary intelligence sources, Wang Xiucheng [29] used fuzzy mathematics methods to formulate five evaluation indicators and corresponding processes, including novelty, reliability, completeness, timeliness of dissemination, and conciseness of narrative content. For website intelligence source analysis, NATO proposed five criteria: accuracy, reliability and authority, objectivity, effectiveness, and relevance [30]. These represent general evaluation indicators for OSINT from a macro perspective.

Beyond static indicator evaluation methods, L. English proposed shifting the focus of information quality assessment from data and information themselves to information users or the information generation process [31]. Zou Pei established an evaluation framework for open source data comprising three dimensions: data process, data correlation and contextual analysis, and intelligence professional knowledge [32]. Researchers have also explored evaluation tools, such as D. Noble's proposal and development of a novel data collection and information management tool that implements structured processing of report-based OSINT, extracting key features to enhance evaluation objectivity [33].

In summary, evaluation occupies an important position in OSINT research, and establishing a universal analytical framework represents a primary concern. However, specific evaluation elements vary according to the professional knowledge characteristics of different domains. With the increasing specialization of the social division of labor, OSINT work has gradually shifted from traditional intelligence personnel to domain professionals, necessitating tailored intelligence evaluation. Establishing domain- and industry-specific OSINT evaluation is crucial for overall intelligence work. Currently, research on OSINT in the think tank field remains undeveloped, lacking theoretical support and evaluation frameworks for analyzing OSINT from think tank sources.

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3. Open Source Nature as a Fundamental Attribute of International Think Tanks

The diversity of OSINT sources and low access thresholds create certain challenges, primarily concerning the varying accuracy, reliability, and value of intelligence sources. Evaluating OSINT sources is therefore essential. For international think tanks, their open source nature is manifested in three aspects: legal identity attributes, emphasis on self-dissemination, and positioning within social networks.

3.1 Open Source Nature in Identity Attributes

From a legal perspective, many international think tanks operate as non-profit organizations, meaning they prioritize public interest over profit. Taking U.S. think tanks as examples, most are registered under Section 501(c)(3) of the tax code, which provides tax exemptions for academic institutions, foundations, charitable organizations, and other non-governmental entities, and serves as the legal basis for think tank operations. This non-profit legal status requires think tanks to comply with certain legal standards and fulfill their legal obligation to provide decision-making consultation for the government. While legal provisions offer benefits to many international think tanks, they also demarcate boundaries between these organizations and private or for-profit institutions. These legal requirements mandate that think tanks cannot pursue profit as their goal and must promptly disclose research findings and funding sources to demonstrate objectivity.

Beyond legal status, think tanks' missions and positioning also guarantee their open source nature. International think tanks engage in public policy research and decision-making consultation, pursuing public value and objectives—entities detached from the public policy domain do not qualify as think tanks. Since the development of public policy in Western societies, it has been closely linked to public interest. Publicness constitutes the logical starting point for public policy development, requiring think tanks' decision-making research and related work to remain connected to public participation. Foreign academia generally considers think tanks as bridges connecting decision-makers and civil society [34], establishing communication upward with decision-makers and downward with civil society. This means think tanks are part of civil society and, as special civil society organizations, have a responsibility to represent citizens. Besides feeding public voices back to decision-makers, they also transmit decision-related information to the public, guiding public opinion and influencing civil society discourse systems. From this perspective, public communication and dissemination constitute an inseparable part of international think tanks, generating substantial public information that becomes open intelligence sources.

3.2 Emphasis on Self-Dissemination Provides Abundant Open Source Information

International think tanks operate in a highly competitive policy ideas market and must build strong influence to survive. Dissemination represents a crucial link for international think tanks to establish influence—by spreading their ideas, viewpoints, values, and achievements to gain recognition from broader audiences, thereby building brand image and reputation to truly enter decision-making service circles. Unlike general academic research institutions that primarily disseminate through academic papers, monographs, and conferences to expert audiences, think tank communication targets not only government officials and parliamentarians in the inner circle but also other stakeholders. In the era of internet and information technology, information dissemination and acquisition have become easier than ever. To enhance influence, international think tanks attach great importance to utilizing media, especially online media, to publicize their concepts and policies, enabling broader audience groups to understand their viewpoints.

For influential international think tanks, emphasis on dissemination channel construction is complemented by prolific output during actual dissemination processes. Taking the renowned Brookings Institution as an example, its website regularly publishes reports, books, academic papers, and videos, with diverse information types. Statistics show that Brookings published 109 academic papers searchable on Web of Science in 2019 alone. According to its 2019 annual report [36], between July 2018 and June 2019, Brookings published 32 books. The institution also emphasizes utilizing online and new media platforms, with its website experiencing a 15% increase in total visit duration and a 3% increase in visitors that year, a 64% increase in Instagram followers, 196 videos shared on YouTube (a 37% year-over-year increase), and over 10 million podcast downloads, with 60,000 new briefing subscribers added. Through dual control of process and outcomes, the think tank wins greater influence while providing the external world with substantial accessible and original information.

3.3 International Think Tanks as Open Institutions Within Social Networks

From a social network structure perspective, think tanks are not closed interpersonal networks but highly open institutions. This openness grants them strong boundary-spanning capabilities, enabling exchanges across different fields. Academia, politics, media, business, and other fields each possess their own internal operational logics and resource endowments, but few institutions can integrate these resources. Think tanks enjoy unique geographical advantages within social networks, serving both as venues for exchanging opinions and coordinating interests among various parties and as hubs for information exchange and sharing. By absorbing different resources from different fields, think tanks sustain their operations. Personnel mobility is key to forming this boundary-spanning capability. Since think tank information derives

not only from formal communication channels but largely from informal interpersonal network exchanges—and the latter often yields higher-value information—international think tanks typically establish their own expert networks to address real-world decision-making consultation needs, leveraging their boundary-spanning advantages to invite experts from different fields as resident or part-time staff. The "revolving door" mechanism represents the most famous form of personnel mobility, allowing think tank experts to move across various fields. Through these experts, think tanks can establish connections with different domains and convey their viewpoints.

For international think tanks, boundary-spanning capability includes not only crossing different fields but also crossing different countries and regions. To expand their influence, international think tanks focus not only on their home country or region but also emphasize international cooperation and exchange. Outputting ideas to the international community through various achievements or activities represents the most common approach to expanding international influence. Some think tanks have even developed specialized foreign exchange programs and established global expert networks, such as providing technical assistance to developing countries, undertaking research projects for foreign official organizations or international organizations, and serving as international consultants. Some think tanks even act as facilitators of "track II diplomacy," proactively establishing contacts with foreign government departments to facilitate international relations.

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4. Value Characteristics of Open Source Intelligence from International Think Tanks

The analysis above demonstrates that international think tanks can serve as important sources of OSINT. Intelligence obtained from international think tanks possesses both general characteristics of OSINT and unique features derived from think tank work, including professionalism, policy-orientation, early warning capability, evidentiary value, and data value.

4.1 Professionalism

As professional institutions specializing in decision-making consultation, international think tanks produce information and knowledge with corresponding professionalism. Their level of professionalism is jointly influenced by institutional attributes, composition, and products. First, in terms of institutional attributes, international think tanks are typically non-profit organizations dedicated to producing specialized knowledge in the public policy domain, requiring them to maintain objective positions in their research and operations. Consequently, think tanks highly value branding themselves as "independent," with the "independence" label becoming a common standard for measuring think tank professional capabilities internationally. Second, in institutional composi-

tion, think tanks' specialized knowledge production relies on professional talent, particularly experts with specialized backgrounds as core components. These experts are typically leading figures or experienced professionals in relevant policy research fields. Beyond individual experts, professional research teams provide intellectual support. Since real-world policy research problems often require knowledge from multiple disciplines, international think tanks' research teams typically recruit PhDs or Masters trained in specific disciplines while seeking diversity in professional backgrounds. On this foundation, think tanks not only possess specialized knowledge but also present and disseminate it through various products, using different information organization and processing methods according to different product characteristics.

4.2 Policy-Orientation

In OSINT work, judging the core value of intelligence sources helps capture required intelligence more efficiently. The core function of think tanks lies in decision-making consultation, making them more prominent in policy research characteristics compared with other institutions and generating substantial policy-functional information. Policy-orientation is typically contrasted with academic orientation, with researchers noting numerous differences in research processes, methods, techniques [37], industry subjects, and work content [38]. Although think tank research cannot be separated from academic research as a foundational guarantee, it is not purely academic research. Academic research outputs typically follow standardized scientific procedures with stronger disciplinary and theoretical orientations. Think tank research outputs, however, primarily address real-world policy problems, forming predictive judgments on decision-making issues with greater emphasis on practicality and forward-looking value, while exhibiting more obvious interdisciplinary or multidisciplinary characteristics. Moreover, from an intelligence collection perspective, think tank information dissemination primarily depends on think tank products, whose main value lies not in academic worth but in disseminating policy viewpoints.

This policy-orientation is also reflected in the timeliness of think tank work. International think tanks often operate in fast-paced environments, determined by the nature of policy research consultation. Policy research is primarily problem- or issue-driven, focusing on hot issues and frontier policy topics. The real decision-making world is constantly changing, requiring think tanks to remain on standby to respond promptly to external decision-making environmental demands. Failure to voice timely opinions or overly long production cycles can affect the practical effectiveness of think tank research.

4.3 Early Warning Capability

When major policies and regulations are formulated in Western developed countries, they typically undergo lengthy policy debate processes, during which think tanks actively intervene in policy agendas. Taking the United States as an exam-

ple, under its "separation of powers" system, Congress holds legislative power. Before major legislative policies are introduced or during investigations of important social events, Congress typically holds hearings to collect opinions from various parties—a process that essentially constitutes policy debate. Think tank experts are commonly invited to attend hearings, and their opinions receive significant attention during the formulation of relevant policies and regulations. Additionally, internal think tank circles frequently organize debates, typically focusing on public policy issues of greatest social concern, where experts with different positions gather for discussion. Therefore, before many actual policy issues mature, related debates may have already been intensely discussed within think tank circles. Information formed around such issues thus possesses important intelligence value and often releases certain policy signals with strategic and forward-looking functions, providing early warnings for future decision-making realities. Particularly in U.S. policy toward China, think tank participation in policy debates has played an important driving role and influenced the U.S. government's policy orientation toward China. For example, discussions of the famous "Thucydides Trap" have long been prevalent in U.S. think tank circles but failed to attract sufficient domestic attention.

4.4 Evidentiary Value

Public policy formulation requires substantial facts and evidence. With the development of evidence-based decision-making, the significance of evidence for think tank research has become increasingly prominent. The term "evidence" originates from legal terminology, where only materials meeting certain standards can be considered evidence. Although its application in evidence-based decision-making differs from legal contexts, it retains shadows of legal evidence [39]. The demand for evidence emphasizes that think tank products are not subjective speculation but scientific judgments based on objective facts. Think tank researchers must fully collect all necessary information and data, employ scientifically valid research methods, and conduct rigorous research and demonstration to reach conclusions. Consequently, most international think tanks strongly emphasize an "evidence-based" research paradigm, with renowned institutions such as RAND Corporation and Brookings Institution even establishing specialized evidence-based research networks to strengthen evidence construction. From this perspective, think tank products contain extensive evidence information, including not only traditional scientific research but also tacit knowledge from experts and various social considerations, possessing comprehensive evidentiary value. Evidence not only enhances the reliability of think tank research but can itself be transformed into intelligence, even being regarded as intelligence in decision-making contexts.

4.5 Data Value

As knowledge-intensive institutions, think tanks essentially process knowledge. Since international think tanks are diverse, different types focus on different

priorities. Some specialize in social surveys and survey report publication, such as the Pew Research Center and NORC at the University of Chicago. These think tanks' research achievements often require substantial raw data support, with data forming a necessary component of policy texts. For example, as a benchmark in this category, the Pew Research Center obtains large data samples through various survey methods to support policy research in different thematic areas. On this basis, Pew has established multiple databases, including a "question bank," "PPT material bank," "methodology bank," and "multimedia material bank" [40], to facilitate data management. Beyond obtaining data through surveys, think tanks such as Pew Research Center and Bruegel have also opened access to some datasets, publicly releasing statistical survey data generated in specific research projects on their websites after certain confidentiality periods to enable social sharing and secondary research utilization [41]. Promoting open access and utilization of data has enabled some think tanks to extend their influence beyond the public policy domain, being cited as relatively reliable data sources by education, business, and other sectors.

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5. Constructing an Evaluation Framework for Open Source Intelligence from International Think Tanks

OSINT is not finished intelligence but rather raw intelligence that provides material for intelligence analysis. Quality assessment of raw data and information is critical and runs throughout the OSINT process. However, this paper's evaluation of OSINT from international think tanks primarily focuses on the intelligence collection phase, oriented toward the front end of intelligence analysis. Since think tanks cover diverse policy research fields with varying intelligence requirements across domains, this evaluation does not address the assessment of intelligence utility and content value within specific policy research fields. Accordingly, this paper primarily draws on NATO system evaluation methods (Admiralty Code) to construct an evaluation framework for OSINT from international think tanks. This system is mainly used for assessing intelligence collection projects, evaluating information across two dimensions: source reliability and information content credibility [42]. The former relies more on objective factors, while the latter requires subjective analysis and judgment.

Therefore, in the evaluation framework for OSINT from international think tanks (see Figure 1 [Figure 1: see original paper]), given the obvious trend toward specialized division of labor in international think tank development, intelligence personnel and domain experts should establish cooperation as joint evaluators, integrating their respective professional expertise and conducting evaluations based on both objective and subjective factors. Regarding evaluation objects, the assessment of OSINT from international think tanks should comprise two components: intelligence source evaluation and intelligence content evaluation. Source evaluation itself is not the end goal but primarily serves as a means to evaluate content quality [43].

5.1 Intelligence Source Evaluation

According to information research theory, reliability is the most critical characteristic required of sources. Based on social psychology research, C.I. Hovland et al. proposed that source reliability depends on professionalism and credibility in all circumstances [44], with subsequent studies adopting these two factors as evaluation criteria. Evaluating open sources essentially involves screening and classifying intelligence sources to identify those international think tanks with genuine OSINT value.

On one hand, think tank professionalism is determined by the degree of professionalization in think tank operations and the professional level of talent teams. Professional operation teams and institutional frameworks form the foundation for talent team construction. Within talent teams, experts typically serve as core intellectual resources, with influential research achievements often led by these experts. Whether experts possess senior professional research capabilities and authority in relevant policy fields is crucial for think tanks. Beyond star experts, the establishment of think tank research teams and their members also contribute from different perspectives. Since policy research is mostly interdisciplinary or multidisciplinary, teams composed of members from different professional backgrounds help enhance research professionalism. Meanwhile, professional think tank outputs are also products of think tank professionalism, with achievements following data-driven and evidence-based research paradigms often demonstrating higher professional standards.

On the other hand, regarding institutional reliability, think tank independence and credibility are the evaluation focus. Independence ensures objectivity in think tank outputs, providing more reliable information. Since most international think tanks adopt corporate operation models, their governance structures directly affect independence. Evaluators should examine whether think tanks possess corresponding governance bodies such as boards of directors, expert advisory committees, advisory boards, and management committees, the composition of personnel at different governance levels, and the diversity of governance team members' backgrounds. Funding sources also constitute an important factor affecting governance. International think tanks generally emphasize funding source diversification not only to sustain operations but also to reduce risks of compromised independence or research intervention. Typically, to win funders' trust, think tanks publish their funding source status in annual reports to demonstrate independence. Additionally, think tank credibility concerns institutional reputation, with news media or third-party reports helping to understand think tanks' standing, enabling intelligence collectors to focus on higher-reputation international think tanks as quality information sources.

5.2 Intelligence Content Evaluation

Intelligence content evaluation forms the core of assessing OSINT from international think tanks. Since think tank information is not single-form or single-

dimensional but composite, content evaluation involves the following eight elements:

5.2.1 Authenticity

Authenticity is the primary consideration for OSINT, requiring intelligence content to objectively and accurately reflect facts. When collecting OSINT from international think tanks, evaluators should examine whether the information content is sufficiently objective and credible, whether expressions and conclusions have undergone rigorous scientific demonstration, and whether information providers' positions and attitudes contain biases that could cause deliberate distortions and interfere with subsequent intelligence analysis. Beyond examining the intelligence content itself, using non-think-tank-propagated information can help verify authenticity by checking background information for inconsistencies or contradictions with think tank information, thereby assessing the truthfulness of intelligence released by think tanks.

5.2.2 Completeness

Completeness includes both formal feature completeness and content completeness. Regarding formal features, intelligence collectors must verify whether relevant elements are complete during think tank intelligence collection, such as information publishers, authors, publication times, and sources of images or videos. The more complete these elements, the higher the quality of collected intelligence, and these formal elements can sometimes provide clues for OSINT analysis. Regarding content, completeness depends partly on specific intelligence analysis processes and partly on the integration of fragmented information and establishing connections between information pieces at the collection stage—the latter being the focus of this evaluation. Since think tanks disseminate information through diverse channels, collectors should strive to gather all information on similar themes from different channels.

5.2.3 Timeliness

The real decision-making world constantly generates new problems, resulting in fast-paced work styles at international think tanks and correspondingly rapid information update frequencies. "Slow and meticulous" research is unsuitable for addressing practical decision-making consultation needs; think tank products with short production cycles can more timely and flexibly respond to real policy demands, such as instant commentaries, television interviews, and expert seminars. These outputs often possess greater timeliness value, especially when think tanks quickly organize expert discussions in response to sudden social problems—the most common measure. Therefore, during intelligence collection, evaluators should focus on think tank information update frequencies and compare social news with think tank information within the same timeframe to observe whether think tanks can voice opinions promptly.

5.2.4 Predictability

As previously discussed, early warning capability represents one of the value characteristics of OSINT from international think tanks. Predictability evaluation focuses on whether intelligence possesses early warning functions and

forward-looking significance. As strategic forward-looking observation and predictive research institutions [45], international think tanks must continuously monitor and track policy agendas, timely understand decision-making changes, and promote relevant issues onto agendas—processes influenced by both external and internal triggering mechanisms. External triggers are determined by actual social development conditions and decision-making demands, while internal triggers primarily arise from think tank policy debates. During periods when many issues have not yet formed mature decision-making outcomes but may become precursors or indicators of public policy formulation, evaluators should focus on whether OSINT possesses predictive functions to identify intelligence with foresight regarding future policy changes and developments.

5.2.5 Practicality

International think tank achievements typically constitute the most information-rich intelligence sources. However, unlike outputs from general research institutions, evaluation of these achievements should emphasize practicality rather than academic intelligence value. Practicality stresses whether achievements can affect the real world and provide countermeasures and suggestions for actual decision-making needs in the public domain, focusing on applied value. The type of audience for achievement dissemination can serve as an important reference, as achievements targeting different audiences play different roles. For instance, professional articles published in peer-reviewed journals target professional peers and focus on academic theory exploration, making it difficult to influence decision-makers or the general public even when related to policy or social reality. Only achievements with strong think tank attributes disseminated to policy decision-making-related groups can maximize practical utility of policy research, such as consultation reports, policy briefs, and hearing attendance—these think tank outputs contain more practically valuable information.

5.2.6 Counter-Intelligence Considerations

Since many international think tanks are involved in international relations and defense policy fields, they may attract attention from foreign governments or relevant departments. Particularly amid intensifying national competition, counter-intelligence work has not only drawn government attention but also involved think tanks as policy research institutions closely related to decision-making consultation. For example, as the country with the largest number and broadest influence of think tanks, the United States has raised concerns about foreign governments utilizing think tanks for intelligence work [46]. Some think tanks have accordingly implemented counter-intelligence measures to prevent becoming tools of foreign political forces. Therefore, when collecting public information from international think tanks or engaging in informal exchanges with think tank personnel, intelligence awareness is necessary to identify whether think tanks are disguised intelligence agencies or deliberately release certain signals through public information dissemination to hide their true intentions and guide public opinion, requiring evaluation of think tanks' positions and dissemination motives.

5.2.7 Understandability

Previous interpretations of intelligence understandability mostly addressed users, determined primarily by users' cognitive and comprehension levels. However, this paper's interpretation differs, focusing on the language used in intelligence content. Since public communication represents an important function of international think tanks, information disseminated through public platforms and media should use language easily understood by the public. This includes think tank blogs, online columns, and public speeches. Taking public speeches as an example, TED serves as an internationally renowned public speaking platform where many experts from international think tanks have been invited to speak, but they must use language understandable to the general public for audiences to receive their messages.

5.2.8 Traceability

Among the vast amount of information obtained from OSINT, most should be fixed-content products such as texts, images, and videos, with textual products constituting the vast majority of think tank information. As knowledge-intensive research institutions, think tanks are most proficient in producing knowledge-based textual products [47], with output far exceeding other product types. However, such products have a drawback: textual products make it difficult to grasp the entire production process and trace the origins of final output information. Therefore, intelligence evaluation should also consider traceability, restoring collected information to its spatiotemporal context of formation and reconstructing the "background" or "contextual" information related to the intelligence production chain. Only in this way can the effectiveness of think tank OSINT be truly realized.

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Author Contributions

Zou Jingya: Framework design, literature collection and analysis, paper writing and revision.
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Research on the Evaluation Framework of Open Source Intelligence from International Think Tanks

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Abstract: [Purpose/Significance] Evaluation forms the foundation of open source intelligence work. Although international think tanks represent an important source of open source intelligence, they have not received adequate attention, with theoretical research lagging behind practical needs. This study establishes an evaluation framework for open source intelligence in the think tank domain, aiming to provide theoretical supplementation for research on open source intelligence from think tanks and offer references for practical open source intelligence work in this field. [Method/Process] Focusing on the intelligence collection perspective, this paper uses deductive reasoning to demonstrate that open source nature is a crucial prerequisite for international think tanks to serve as sources of open source intelligence. Based on this foundation and com-

bined with the inherent characteristics of international think tanks, it identifies the main features of open source intelligence from international think tanks: professionalism, policy-orientation, early warning capability, evidentiary value, and data value. These features provide a theoretical basis for open source intelligence evaluation. Drawing on NATO system evaluation methods, the paper constructs an evaluation framework for open source intelligence from international think tanks. [Result/Conclusion] In this evaluation framework, intelligence personnel and domain experts must collaborate as joint evaluators. The evaluation objects should encompass both intelligence source assessment and intelligence content assessment. Source evaluation should focus on think tank professionalism, independence, and credibility, while content evaluation should examine eight key elements: authenticity, completeness, timeliness, predictability, practicality, counter-intelligence considerations, understandability, and traceability.

Keywords: international think tanks; open source intelligence; intelligence sources; intelligence evaluation; Brookings Institution; think tank communication

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