An Analysis of the Value Orientations of Chinese Government Big Data Policy (Postprint)

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Abstract

[Purpose/Significance] Big data policies serve as a driving force for the application and development of big data. Analyzing their value orientations can provide valuable insights for the formulation, implementation, and evaluation of big data policies by the Chinese government, and establish a foundation for determining the future development trajectory of such policies.

[Method/Process] This study collected 58 government big data policy documents published on the official portals of the State Council and its various departments. Thematic analysis was employed to code and analyze the themes expressing value orientations of government big data within these policy texts, with NVivo12 software utilized as an auxiliary tool during the coding process.

[Results/Conclusion] Through thematic analysis, an overall framework for the value orientations of big data policies was constructed. The framework encapsulates value orientations across five dimensions—political, economic, social, ecological, and technological—and examines the interactive relationships among these dimensions and their specific value orientations.

Full Text

Preamble

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Title: An Analysis of the Value Orientation of Chinese Government Big Data Policy

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Abstract: [Purpose/Significance] Big data policy is a driving force for the application and development of big data. Analyzing its value orientation can provide reference for the formulation, implementation, and evaluation of Chinese government big data policies, and offer a basis for the future development direction of big data policies. [Method/Process] This study collected 58 government big data policy texts published on the portals of the State Council and its various departments, and used thematic analysis to encode themes expressing government big data value orientation in the policy texts. The encoding process used NVivo 12 software as an auxiliary tool. [Result/Conclusion] Through thematic analysis, an overall framework of big data policy value orientation was constructed. The framework summarizes value orientations across five dimensions—political, economic, social, ecological, and technological—and explores the interactive relationships among these dimensions and their specific value orientations.

Keywords: big data; policy; value orientation

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Introduction

The era of big data has brought about transformations in thinking, business, and management [1]. In recent years, it has profoundly influenced various fields of human society. For instance, intelligent manufacturing centered on industrial big data has become an important component of economic transformation and upgrading [2]; the analysis and mining of health big data can play a positive role in health assessment, medical assistance, chronic disease management, and disease prediction [3]; and the application practices of government big data in the public service domain, such as data exchange and open sharing, have also triggered a new round of innovation in government governance [4]. To deepen the application and development of big data, the Chinese government has successively issued a series of policies. However, in the early stages of big data construction, questions regarding the functional domains, specific objectives, and actual effects of these policies remain unclear and require careful examination.

Policy value orientation reflects the value-based choices made by policy subjects during the policy formulation process, which includes value judgment, value orientation, and value creation and realization [5]. Value orientation represents the value distribution choices made by policy subjects according to certain standards, reflecting the preferences, personal aspirations, and objectives of policymakers [6]. It plays guiding, motivating, integrating, and evaluating functions in the policy implementation process [7]. Currently, research on policy value orientation mainly concentrates on education policy, public policy, and ethnic policy, with content primarily covering the historical evolution and future development of policy value orientation. Education policy encompasses multiple levels including preschool education [8], higher education [9], vocational

education [10], and continuing or adult education [11]. Kong Lingshuai elaborated on the evolution of value orientation in U.S. basic education policy from post-WWII to before the new century, and analyzed the influencing factors of value orientation in American basic education policy in the new century by examining the conflict between the Obama administration's innovations in basic education and the continuity of education policy [12]. To grasp the changes in public policy value orientation across different historical development stages, Jiang Mingsheng analyzed the objective environment, main objectives, driving factors, and means of the historical evolution of sinicized Marxist public policy value orientation, and explored future development trends [13]. Li Shaohui and Wang Ting used ROST and NVivo qualitative analysis tools to conduct textual encoding analysis of central-level public cultural service policies from 2005-2018, summarizing the value orientation and evolutionary structure of China's public cultural service policies [14]. Zhou Ping elaborated in detail on the concept, development, and function of "nationalism" as a value orientation in ethnic policy, proposing that "nationalism" should be adjusted toward "statism" under the premise of minority development [15]. He Longqun argued that the value orientation of the Chinese Communist Party in formulating ethnic policies is to centrally represent the will and interests of people from all ethnic groups [16]. From the perspective of value orientation, traditional policy research takes the objective environment and influencing factors of policy development as the starting point to explore the developmental trajectory of policies. Research methods are primarily qualitative, relying on researchers' knowledge reserves and logical thinking in the disciplinary field, and lacking objective analytical means.

2 Literature Review

2.1 Policy Value Orientation

Value orientation is a fundamental issue in policy science research. Since the 1980s, influenced by positivist methodology, policy science has shifted from one-sidedly emphasizing economic and technical rationality to strengthening research on value issues, including value judgment, value orientation, and value creation and realization [5]. Value orientation represents the value distribution choices made by policy subjects according to certain standards, reflecting the preferences, personal aspirations, and objectives of policymakers [6]. It plays guiding, motivating, integrating, and evaluating functions in the policy implementation process [7]. Currently, research on policy value orientation mainly concentrates on education policy, public policy, and ethnic policy, with content primarily covering the historical evolution and future development of policy value orientation. Education policy encompasses multiple levels including preschool education [8], higher education [9], vocational education [10], and continuing or adult education [11]. Kong Lingshuai elaborated on the evolution of value orientation in U.S. basic education policy from post-WWII to before the new century, and analyzed the influencing factors of value orientation in American basic education policy in the new century by examining the conflict

between the Obama administration's innovations in basic education and the continuity of education policy [12]. To grasp the changes in public policy value orientation across different historical development stages, Jiang Mingsheng analyzed the objective environment, main objectives, driving factors, and means of the historical evolution of sinicized Marxist public policy value orientation, and explored future development trends [13]. Li Shaohui and Wang Ting used ROST and NVivo qualitative analysis tools to conduct textual encoding analysis of central-level public cultural service policies from 2005-2018, summarizing the value orientation and evolutionary structure of China's public cultural service policies [14]. Zhou Ping elaborated in detail on the concept, development, and function of "nationalism" as a value orientation in ethnic policy, proposing that "nationalism" should be adjusted toward "statism" under the premise of minority development [15]. He Longqun argued that the value orientation of the Chinese Communist Party in formulating ethnic policies is to centrally represent the will and interests of people from all ethnic groups [16]. From the perspective of value orientation, traditional policy research takes the objective environment and influencing factors of policy development as the starting point to explore the developmental trajectory of policies. Research methods are primarily qualitative, relying on researchers' knowledge reserves and logical thinking in the disciplinary field, and lacking objective analytical means.

2.2 Big Data Policy

Since its inception, the concept of big data has attracted significant attention. To fully leverage its strategic value and address contemporary challenges, countries worldwide have issued numerous strategic plans, policies, and regulations centered on big data. Due to differences in national environments and development levels, the emphases of big data policies also vary. Zhang Yongjin and Wang Jingxuan comparatively analyzed the big data policies of the United States, Australia, the United Kingdom, and France from three aspects: strategic planning, technical capability enhancement policies, and application and management policies [17]. Surveys have found that foreign big data policies focus primarily on privacy and security issues, with widespread concerns that data analysis results obtained through big data may be misused [18]. E. Vayena and A. Blasimme particularly highlighted the security issues of health data, emphasizing the importance of proactive legislation to protect personal sensitive data [19]. In recent years, China has also begun to pay attention to data security and privacy protection, particularly in resolving conflicts between data openness and data security and personal privacy in government data opening and sharing policies [20]. Some scholars have drawn on the policy and regulatory guarantees of data openness in the UK and US to provide references for China [21-22].

Additionally, research on China's big data policies has included policy focus areas and evolutionary development, primarily employing quantitative research methods such as content analysis, bibliometrics, and word frequency analysis to provide guidance for the development of China's big data policies. For example,

Liu Yaya et al. used a "policy tool-policy keyword" two-dimensional framework to quantify and analyze policy content, tracing the development trajectory of China's big data policies, policy themes, and commonly used policy tools [23]; Ding Wenyao et al. employed content analysis and social network analysis to study the spatiotemporal diffusion models and content transfer characteristics of big data policies issued by various provinces and municipalities in China, revealing development trends and content correlations in local big data policies [24]; Xu Lei et al. used grounded theory, word frequency analysis, and policy strength measurement methods to analyze policies issued by national-level big data pilot zones, identifying current focus areas and deficiencies in these policies [25].

Research on big data policies from the value orientation perspective is relatively scarce. Only Zhang Huiping et al. used word frequency analysis software and keyword extraction methods to analyze big data policy texts, demonstrating that big data policies have value orientations of "innovation-driven development," "data aggregation as the main line," and "security guarantee as the prerequisite" based on keyword frequency and the centrality of corresponding nodes [26]. However, this study did not explore the internal interactive relationships among various value orientations and failed to construct a complete value orientation relationship framework.

Overall, although existing literature has conducted rich research on the coverage and development trajectory of big data policies, it has paid less attention to value orientation issues. Moreover, most studies are quantitative, and while they can objectively quantify and articulate big data policy content, they are limited by pre-set analytical frameworks and lack sustained in-depth exploration of research findings [27]. Value orientation reflects policy formulation goals and visions. Exploring the relationships among various value orientations can better interpret whether policies align with complex real-world situations and provide guidance for policy development and renewal.

The innovation of this study lies in its adoption of qualitative research methods, departing from external factors to deeply analyze the value orientations reflected in big data policy content itself, as well as the interactive relationships among specific value orientations, thereby providing a theoretical foundation for policy evaluation.

3 Research Design

3.1 Technical Route

This study adopts a qualitative research approach. First, it selects policies issued at the national level from 2006-2019 related to big data and its associated fields as research objects. Second, based on existing research and the characteristics and significance of big data, it chooses analytical dimensions for policy value orientation. Third, it arranges and numbers the collected policy texts and imports them into NVivo software, using sentences or paragraphs expressing

a certain value orientation as the unit of analysis, applying thematic analysis for main idea extraction and coding, and categorizing them into corresponding analytical dimensions. Finally, based on the coding data from all policy texts, it clarifies the current priorities of big data work and further explores the relationships among specific value orientations to construct a complete big data policy value orientation system.

3.2 Research Method

Thematic analysis is a fundamental method of qualitative research.

3.3 Data Collection and Processing

The policy texts selected by the author are derived from publicly available data sources that can be accessed and downloaded from government portal websites. Due to the large number of policy texts related to big data, the following principles were applied to select representative texts: First, the issuing authority must be the State Council or its various directly affiliated departments, as national-level big data policies are more authoritative and can reflect national will and trends of the times. Second, the policies must be closely related to big data; in addition to policies on big data technology application and development, policies related to big data technologies and fields (Internet+, cloud computing, artificial intelligence, etc.) are also included. Third, regarding policy types, documents such as action plans, programs, notices, and opinions were selected. Through screening, a total of 58 valid policy texts were obtained. All policy texts were numbered according to the format of issuance year-issuing authority-policy type-text serial number. Among these, the issuing authority is represented by the English abbreviation of the first responsible department that issued the policy text. If the issuing authority is a unit under a government department, the English abbreviation of its superior department is selected. Since the State Council implemented a new round of institutional reform on March 17, 2018, the principle of historicism was followed, and for issuing authorities with adjusted names, the corresponding English abbreviations before and after the reform were selected. Policy types are mainly divided into two categories: special policies (special policies) and relevant policies (relevant policies). Special policies refer to a series of policies specifically targeting big data application and development, while relevant policies focus on technologies or fields closely related to big data. The text serial number is a sequential number arranged chronologically for texts of different policy types.

3.4 Analysis Dimensions

The analysis of policy value orientation must fully consider the manifestation of policy value in different social domains. Modern social structure theory posits that society as a whole comprises four major domains: political, economic, cultural, and narrowly-defined social domains, with policy value correspondingly expressed as political value, economic value, cultural-moral value, and social

value [31]. Big data policy is an important tool for the government to guide and regulate the application and development of big data, and the formulation of relevant policies inevitably reflects the value objectives and intrinsic requirements of big data. As a product of technological development, big data undoubtedly possesses important technological value. Moreover, big data was born to address complex data, with its goal being to process data to identify and transform patterns hidden behind data [32]. This also implies that in the big data environment, the management decision-making paradigm is shifting toward being data-centered [33]. Using big data to monitor the ecological environment and timely manage and analyze massive, heterogeneous data has become an effective measure to address many problems in ecological and environmental protection [34]. Meanwhile, data-driven management decision-making has also exerted tremendous influence on government management and services, economic development, and social governance. Therefore, the author selects five dimensions—political, economic, social, ecological, and technological—to analyze government big data policy.

3.5 Data Analysis and Coding

The policy texts imported into NVivo 12 software were subjected to bottom-up thematic analysis and coding, proceeding level by level (open coding → axial coding → selective coding). To facilitate later retrieval, browsing, and statistics, NVivo manages concepts, categories, or themes formed through coding as nodes. Open coding uses sentences or paragraphs in the text as units to excavate their main concepts. Each node (concept) formed at this stage has corresponding content as support, but because it has not undergone further categorization and does not have obvious associations with others, it can also be called a "free node." Axial coding involves discovering and establishing connections among concepts to form higher-level categories that can group these concepts together. During axial coding, only one category is analyzed in depth at a time, with related nodes sought around that category. Selective coding involves inducting core categories from existing conceptual categories that encompass all concepts. Core categories must be overarching and capable of placing most conceptual categories within a broader theoretical context. Since the author pre-defined analytical dimensions, coding according to different dimensions can further reduce coding difficulty. Through axial coding and selective coding, "free nodes" can be transformed into "tree nodes" with hierarchical relationships. "Tree nodes" have at most a three-level structure, namely "third-level nodes," "second-level nodes," and "first-level nodes," where third-level nodes are sub-nodes of second-level nodes, and second-level nodes are sub-nodes of first-level nodes.

4 Research Results

From the 58 selected policy texts, 397 original statements related to value orientation were analyzed. Through conceptual coding of these statements, 41 free nodes were formed, constituting 5 thematic dimensions.

4.1 Political Dimension Value Orientation

Although China has established a certain foundation in big data development and application, problems still exist, including "insufficient government data openness and sharing, weak industrial foundation, lack of top-level design and overall planning, lagging laws and regulations construction, and narrow innovation application fields" (2015-SC-SP-2, where the code represents the 2nd policy text, namely the big data special policy issued by the State Council in 2015, hereinafter the same). To this end, the State Council issued the "Action Outline for Promoting Big Data Development," proposing to accelerate the construction of a data powerhouse and achieve the transformation from a "digital power" to a "data power" development goal. "The convergence of contemporary information technology and economic society has triggered rapid data growth, and data has become a national fundamental strategic resource" (2016-MLR-SP-8). To enhance the nation's control over data resources, the Fifth Plenary Session of the 18th CPC Central Committee first proposed implementing a national big data strategy, elevating big data to a national strategy.

Promoting the application of big data in government departments is of great significance for building a law-based government, innovative government, clean government, and service-oriented government. As shown in Figure 2 [Figure 2: see original paper], improving government governance capability is an important component of political dimension value orientation. Government governance refers to the governance of social public affairs with the government as the main body, including the government's internal management, macroeconomic regulation, and management of social public affairs [35]. Improving government governance capability covers innovating government management and social governance models, and enhancing the level of government management and social governance. Using advanced big data technologies, the government can establish a management mechanism of "speaking with data, decision-making with data, managing with data, and innovating with data," achieving a transformation from experience-based management to scientific decision-making. Improving government management decision-making and risk prevention capabilities mainly involves using big data technology for data analysis, monitoring, and early warning to provide comprehensive data services for government department management decisions. For example, constructing a land and resources decision support system to "provide thematic services in resource comprehensive supervision, resource exploration and development, and management status monitoring" (2016-MLR-SP-8). Utilizing "space-ground integrated dynamic monitoring data" to carry out "rainwater situation trend forecasting, mountain flood disaster warning, drought monitoring and assessment, and other flood and drought disaster early warning services" (2017-MWR-SP-14). Improving government management efficiency in macroeconomic regulation, industrial development, credit systems, and market supervision is manifested in using big data to enhance data resource acquisition and utilization capabilities, "strengthening economic operation data exchange and sharing, processing and analysis,

and monitoring and early warning" (2016-CCPCCC-RP-37), promoting innovative application of big data in industrial development, accelerating "interconnection and information sharing of credit information systems" (2015-SC-SP-2), "building big data supervision models" (2015-MOA-SP-3), and achieving effective supervision of "system + technology" (2016-NDRC-SP-4).

It is mainly reflected in strengthening social supervision and enhancing government credibility through government data openness. The "Several Opinions on Using Big Data to Strengthen Services and Supervision of Market Entities" issued by the General Office of the State Council clearly states that "except as otherwise provided by laws and regulations, administrative licensing and administrative penalty information should be made publicly available online within 7 working days from the date of the administrative decision" (2015-SC-SP-1). Relying on big data supervision and technical anti-corruption systems promotes government administration according to law. For example, "using big data to achieve transparent management of government negative lists, power lists, and responsibility lists" (2015-SC-SP-2). Establishing data sharing and exchange platforms innovates government service concepts and methods, improving government service levels. For instance, "opening and sharing information system data from various police departments and relevant data obtained by police officers in the performance of their duties to police supervision departments, widely absorbing public evaluations and appeals regarding public security business" (2017-MPS-SP-18). Through "purchasing big data resources and technical services from social forces" (2015-SC-SP-1) and "government-enterprise cooperation (PPP) models" (2015-MOA-SP-3), government administrative costs are reduced, helping to establish an economical government and improve government operational efficiency.

4.2 Economic Dimension Value Orientation

Achieving economic development is the primary objective of government big data policy, and industrial development is an important component of economic development. As General Secretary Xi Jinping proposed in the report of the 19th CPC National Congress, it is necessary to "promote the deep integration of the Internet, big data, artificial intelligence, and the real economy," emphasizing the combination of big data with industries, especially traditional industries. Developing and strengthening the digital economy and sharing economy similarly requires promoting the digitalization and intelligentization of traditional industries.

Specifically, promoting convenient commercial services and stimulating market entity vitality is mainly manifested in using big data technology to simplify license registration procedures, establishing a "multi-department online parallel approval platform," "promoting the optimization of administrative approval processes, accelerating online approval procedures, and improving administrative approval efficiency" (2015-MOA-SP-3). Strengthening and improving market supervision is reflected in the process of "building big data supervision mod-

els and strengthening during- and post-event supervision and services" (2015-MOA-SP-3), improving the relevance and effectiveness of supervision. Additionally, through "government information disclosure and data openness, and open sharing of social information resources to improve the transparency of market entities' production and operation activities" (2015-SC-SP-1), conditions are created for all sectors of society to jointly participate in market supervision. Furthermore, based on the establishment of "enterprise and personal credit information systems" (2006-CCPCCC-RP-27), relying on the nationally unified "credit information exchange platform" (2015-SC-SP-1) provides credit information query services for various units, organizations, and the public to maintain market order and promote fair market competition.

Improving economic operation efficiency and level is mainly manifested in "promoting the networked sharing, intensive integration, collaborative development, and efficient utilization of social production factors" (2015-SC-SP-2), changing traditional production methods and economic operation mechanisms. Using big data technology to improve economic operation monitoring and risk early warning reduces business decision-making errors and lowers operation costs. For example, financial institutions use data analysis to formulate "risk management strategies, risk appetite, risk limits, and risk management policies and procedures" (2018-CBIRC-SP-24), enhancing the effectiveness of risk management systems.

Promoting economic transformation is the top priority of economic development, with its main purpose being to promote the transformation and upgrading of traditional industries and the innovative development of emerging industries. For example, conducting big data applications for industrial development in fields such as "industrial manufacturing, new materials, aerospace, bioengineering, financial services, modern agriculture, and commercial logistics" (2016-NDRC-SP-4). The application of big data in industrial development will inevitably bring about innovation in technology research and development systems, transformation of production management methods, innovation in business models, and reconstruction of the industrial value chain system, forming a new data-driven innovation development model. An open, shared, and collaborative ecosystem is the foundation for the healthy development of the big data industry. "Encouraging enterprises in all links of the ecosystem to strengthen cooperation and build a multi-party collaborative and mutually beneficial industrial ecology" (2016-MIIT-SP-13) is conducive to forming a good pattern of collaborative development among large, medium, and small enterprises. New business forms and models in industrial development, such as the vigorous development of "industrial big data" (2016-MIIT-RP-39), can create new economic growth points and help economic transformation and upgrading.

4.3 Social Dimension Value Orientation

General Secretary Xi Jinping proposed the development concept of "innovation, coordination, green development, openness, and sharing" at the Fifth Plenary

Session of the 18th CPC Central Committee, which points out China's development 思路、发展方向和发展着力点. Innovation is the key to solving development motivation problems, and "the deep integration of big data with mobile Internet, Internet of Things, and cloud computing" (2015-SC-SP-2) can deepen the innovative application of big data in various industries. Promoting cross-industry and cross-domain data resource integration and collaborative innovation helps tap the potential of data resources to support innovation and provides a foundation for the public to develop and utilize data resources. For example, the transportation department, guided by the need to "meet cross-department, cross-regional, and cross-domain business collaboration requirements," promotes the opening of industry data resources to society and "encourages enterprises and social institutions to carry out innovative applications of transportation service big data" (SP-MOT-2016-11).

The meteorological department also proposes to "unite social forces, utilize meteorological big data to integrate meteorological sensitive industry data… and open meteorological information mining tools to society to activate the market value of meteorological data" (2017-CMA-SP-20).

Optimizing public services for people's livelihood is an important goal of social development. By strengthening the application of big data in public management, carrying out convenient service applications, and optimizing the allocation of public resources, service levels in transportation, education, tourism, meteorology, elderly care, medical care, and other areas can be improved. For example, conducting big data application demonstrations in "urban and rural construction, living environment, health and medical care, social assistance, elderly care services, employment, social security, quality and safety, culture and education, transportation and tourism, consumer rights protection, and urban and rural services" (2015-SC-SP-2), combined with new-type urbanization development, implementation of information benefit projects, and smart city construction. As shown in Figure 4 [Figure 4: see original paper]:

4.4 Ecological Dimension Value Orientation

Green development is an important trend in economic and social development. The Notice of the General Office of the National Development and Reform Commission on Organizing and Implementing Major Projects to Promote Big Data Development proposes to develop "green data centers," "encourage the adoption of green and energy-saving methods such as renewable energy, distributed energy supply, and waste equipment recycling and processing, strengthen green procurement, green design, and green construction of new engineering projects," improve green energy-saving levels, and "promote the substitution and application of energy-saving and environmental protection technology products in existing data centers" (2016-NDRC-SP-4). Ecological civilization construction is an important component of the cause of socialism with Chinese characteristics. In response to issues such as resource constraints, environmental pollution, and ecological damage, the 18th CPC National Congress made the strategic deci-

sion to "promote ecological civilization construction." The national "Eleventh Five-Year Plan" similarly proposed to give prominent priority to building a resource-saving and environmentally friendly society. Resource conservation and ecological environment governance are the main directions of ecological construction. Using big data technology can innovate resource management and utilization methods, including "conducting unified registration of national natural ecological space ownership," "integrating ecological space data to optimize resource development and utilization," achieving "full-process, full-coverage dynamic supervision of natural resources," and "strengthening information management of waste resource recycling" (2016-CCPCCC-RP-37). Enhancing ecological environment governance levels is also manifested in transforming environmental management methods and work methods, and strengthening environmental monitoring and supervision capabilities. The "Guiding Opinions on Promoting Water Conservancy Big Data Development" proposes to "use big data technology to strengthen correlation analysis of water environment data" (2017-MWR-SP-14). Enhancing comprehensive ecological environment decision-making and risk prevention capabilities includes strengthening environmental public opinion monitoring, improving environmental emergency response capabilities, and enhancing the predictability of management decisions. See Figure 5 [Figure 5: see original paper].

4.5 Technological Dimension Value Orientation

Scientific and technological innovation plays a supporting role in promoting the application and development of big data and its technologies. Strengthening the construction of big data scientific research innovation bases and building scientific and technological innovation talent teams are the foundation for achieving technological innovation. The Office of the National Forestry and Grassland Administration issued a document establishing the National Ecological Big Data Research Institute to "conduct theoretical and practical research on ecological big data construction" (2017-SFA-SP-15). The construction of scientific and technological innovation talent teams is indispensable in the guarantee mechanism of big data policy. The "Guiding Opinions on Promoting Water Conservancy Big Data Development" proposes to enhance technological support capabilities by "establishing a multi-level and multi-type water conservancy big data talent training system, innovating talent training mechanisms, and actively introducing high-level talents" (2017-MWR-SP-14). Strengthening basic big data research and promoting technology product upgrades are the basic goals of scientific and technological innovation. The "New Generation Artificial Intelligence Development Plan" issued by the State Council proposes to strengthen basic theoretical research on "big data intelligence," "focus on breakthroughs in difficult problems such as unsupervised learning and comprehensive deep reasoning, establish a data-driven cognitive computing model with natural language understanding as the core, and form capabilities from big data to knowledge and from knowledge to decision-making" (2017-SC-RP-45). In the action plan (2015-2018) for implementing the "Guiding Opinions of the

State Council on Actively Promoting 'Internet Plus' Action," the Ministry of Industry and Information Technology proposed to "develop a batch of big data analysis technologies and products for key links such as marketing, R&D design, production manufacturing, and operation management" (2015-MIIT-RP-34) to accelerate the development and application of industrial big data. As shown in Figure 6 [Figure 6: see original paper]:

5 Conclusion and Discussion

The functions of value orientations across the five dimensions—political, economic, social, technological, and ecological—correspondingly manifest as promoting political progress, economic enhancement, social development, technological innovation, and ecological optimization. The value orientations of each dimension have internal connections (see Figure 7 [Figure 7: see original paper]), jointly forming a complete value system that promotes the modernization of the national governance system and governance capabilities.

As shown in Figure 7 [Figure 7: see original paper], scientific and technological innovation is the basic value orientation of big data policy and also the driving force for achieving political progress, economic enhancement, social development, and ecological optimization. Its goal is to improve big data technology level and application capabilities through basic research and technology product development.

The value orientations of the political, social, and economic dimensions demonstrate closer connections, with mutual influences among the three: (1) Regarding the interaction between political and economic dimension value orientations, improving government management efficiency in macroeconomic regulation, industrial development, credit systems, and market supervision can, on the one hand, enhance registration and administrative approval efficiency and strengthen and improve market supervision. On the other hand, providing credit information query services to the public can regulate market entity behavior and stimulate market entity vitality. Moreover, cultivating market-oriented mechanisms for data resource development and utilization under government encouragement creates conditions for enterprise development, which in turn provides the government with more big data technology products and services, reduces government operation costs, helps establish an economical government, and improves government operational efficiency. (2) Regarding the relationship between political and social dimension value orientations, the government carries out convenient service applications through data platforms and online government platforms, enabling the public to access information and conduct transactions more conveniently, thereby improving public service levels. Meanwhile, the public can supervise government behavior by accessing government open data, promoting the construction of a law-based and clean government. (3) Regarding the relationship between economic and social dimension value orientations, encouraging social forces to develop and utilize data resources can stimulate social innovation and entrepreneurship vitality, cultivate a favorable market development environ-

ment, and promote industrial economic development. Simultaneously, economic development can optimize social resource allocation. In the big data era, the trend of data flows guiding capital flows and technology flows has become a development trend. Apps such as Baidu Maps use transportation big data to provide the public with real-time urban traffic information, helping them avoid peak travel times or congested road sections and improving travel efficiency.

Ecological value is a higher-level value goal pursued by big data policy and also the guiding force for political progress, economic enhancement, social development, and technological innovation. It is built on a certain technological foundation while depending on political, economic, and social progress, representing an inevitable requirement for promoting scientific development and social harmony.

This study focuses on national-level government big data policy, adopts thematic analysis methods, and systematically analyzes the main value orientations from five dimensions—political, economic, social, technological, and ecological—while exploring the relationships among these value orientations. It should be noted that some subjectivity is inevitably present in the process of thematic coding of policy content, and big data is developing rapidly, with big data policies continuously changing to adapt to the times. This paper aims to provide a theoretical foundation and 思路 for big data policy analysis and evaluation, offering guidance for the future development direction of big data policies.

References

[1] VIKTOR M-S, KENNETH C. Big Data Era: The Great Transformation of Life, Work, and Thinking [M]. Translated by ZHOU Tao. Hangzhou: Zhejiang People's Publishing House, 2013.

[2] ZHENG Shuquan, ZONG Yuwei, DONG Wensheng, et al. Industrial Big Data: Architecture and Application [M]. Shanghai: Shanghai Scientific and Technical Publishers, 2017.

[3] GU Zuozuo, LI Kang, CHEN Hong, et al. Research on Health Big Data Cloud Service Platform Design and Knowledge Service Mechanism for Dynamic Demand [J]. Information Science, 2019, 37(11): 106-111.

[4] WU Shanpeng, LI Ping, ZHANG Zhifei. Design of Data Governance Framework in Government Big Data Environment [J]. E-Government, 2019(2): 45-51.

[5] CHEN Zhenming. Policy Science—Introduction to Public Policy Analysis [M]. Beijing: China Renmin University Press, 2003: 575.

[6] ZHAO Yingcheng. Research on Public Policy Value Orientation: The Transformation from Economic Government to Service Government [M]. Beijing: Modern Education Press, 2008: 27.

[7] JIANG Wenwu. Research on Value Orientation of Policy Analysis [J]. Administrative Tribune, 2006(4): 42-44.

[8] XING Liya, BAI Xingrui. Evolution of Value Orientation of Preschool Education Policy in China after the Founding of the People's Republic of China [J]. Studies in Preschool Education, 2008(3): 13-15, 40.

[9] XU Hong, DONG Zefang. The 60-Year Evolution of Value Orientation of Chinese Higher Education: From the Perspective of Education Policy [J]. China Higher Education Research, 2010(5): 7-10.

[10] QI Zhanyong, WANG Jiaxin, AN Yingying. The Change Logic and Future Trend of China's Vocational Education Policy [J]. Journal of East China Normal University (Educational Sciences), 2018, 36(1): 104-111, 164.

[11] WANG Haiping, ZHENG Jipeng, MA Ming. The Value Composition of China's Lifelong Education Policy—Text Analysis Based on Nvivo [J]. Adult Education, 2019, 39(9): 1-6.

[12] KONG Lingshuai. Evolution of Value Orientation of American Basic Education Policy in the New Century [J]. Journal of Southwest University (Social Sciences Edition), 2016, 42(5): 93-100, 190-191.

[13] JIANG Mingsheng. Historical Evolution of Sinicized Marxist Public Policy Value Orientation [J]. Theoretical Investigation, 2012(1): 147-150.

[14] LI Shaohui, WANG Ting. Value Identification and Evolution Logic of China's Public Cultural Service Policy [J]. Library, 2019(9): 18-26.

[15] ZHOU Ping. Analysis of Value Orientation of China's Ethnic Policy [J]. Contemporary World and Socialism, 2010(2): 135-141.

[16] HE Longqun. On the Value Orientation of the Chinese Communist Party's Ethnic Policy [J]. Academic Forum, 2003(2): 5-8.

[17] ZHANG Yongjin, WANG Jingxuan. Comparative Study on Big Data Policies of Major Developed Countries [J]. Chinese Public Administration, 2014(12): 113-117.

[18] SCHINTLER L A, KULKARNI R. Big data for policy analysis: the good, the bad, and the ugly [J]. Review of policy research, 2014, 31(4): 343-348.

[19] VAYENA E, BLASIMME A. Biomedical big data: new models of control over access, use and governance [J]. Bioethical inquiry, 2017, 14: 501-513.

[20] HUANG Ruhua, WEN Fangfang, HUANG Wen. Construction of China's Government Data Open Sharing Policy System [J]. Library and Information Service, 2018, 62(9): 5-13.

[21] CAI Jingxuan, HUANG Ruhua. Policy and Regulation Guarantee of U.S. Government Data Openness and Its Enlightenment to China [J]. Library and Information, 2017(1): 10-17.

[22] HUANG Ruhua, LIU Long. Research on Personal Privacy Protection in UK Government Data Opening [J]. Library Development, 2016(12): 47-52.

[23] LIU Yaya, QU Wan, FENG Haihong. Research on the Evolution of China's Big Data Policy System [J]. Science Research Management, 2019, 40(5): 13-23.

[24] DING Wenyao, ZHANG Zili, YU Guoxian, et al. Research on the Diffusion Mode and Transfer Characteristics of Local Big Data Policies in China [J]. Big Data, 2019, 5(3): 76-95.

[25] XU Lei, LI Qing, XIAO Xiangze. Research on Co-word Network of Big Data Policy Based on Grounded Theory [J]. Journal of Modern Information, 2018, 38(6): 157-164.

[26] ZHANG Huiping, GUO Ning, TANG Xikai. Promotion Logic and Future Path: Text Analysis of China's Government Big Data Policy [J]. Journal of Intelligence, 2018, 37(3): 152-157, 192.

[27] YE Ying. Exploration of the Scientific Philosophical Basis and Dual Integration Principle of Qualitative and Quantitative Research Methods in Library and Information Science [J]. Journal of Library Science in China, 2017, 43(2): 4-12.

[28] ARONSON J. A pragmatic view of thematic analysis [J]. The qualitative report, 1994, 2(1): 16-18.

[29] BRAUN V, CLARKE V. Using thematic analysis in psychology [J]. Qualitative research in psychology, 2006, 3(2): 77-101.

[30] BAZELEY P. Qualitative data analysis with NVivo [M]. London: Sage Publications Ltd, 2007: 6-15.

[31] YAN Qiang. On the Value of Public Policy [J]. Journal of Nanjing Political College, 2007(2): 55-58.

[32] CHAUHAN S, AGARWAL N, KAR A. Addressing big data challenges in smart cities: a systematic literature review [J]. Info, 2016, 18(4): 73-90.

[33] CHEN Guoqing, ZENG Dajun, WEI Qiang, et al. Decision Paradigm Shift and Enabling Innovation in Big Data Environment [J]. Management World, 2020, 36(2): 95-105, 211.

[34] JIANG Hongqiang, LU Yaling, ZHOU Si, et al. Research and Application Progress of Ecological Environment Big Data [J]. Chinese Journal of Environmental Management, 2019, 11(6): 11-15.

[35] WANG Puqu. Analysis of the Basic Meanings and Interrelationships of National Governance, Government Governance and Social Governance [J]. Sociological Review, 2014, 2(3): 12-20.

Author Contribution Statement:

Chen Hui: Research framework design and research guidance;

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Duan Yaoqing: Topic selection and guidance on later paper revision.

English Abstract: [Purpose/significance] Big data policy is the driving force for the application and development of government big data. Its value orientation analysis can provide a way for the formulation, implementation and evaluation of Chinese government big data policies, and provide a basis for the future development direction of big data policies. [Method/process] This paper collected a total of 58 government affairs big data policy texts published by the State Council and its departmental portals. The thematic analysis method was used to encode and analyze the themes of big data value orientation expressed in the policy texts. The encoding process used NVivo 12 software as an auxiliary tool. [Result/conclusion] Through thematic analysis, the overall framework of big data policy value orientation was constructed. The framework summarized the value orientations of the 5 dimensions of politics, economy, society, ecology, science and technology, and explored the interaction between each dimension and its specific value orientation.

Keywords: government big data; policy; value orientation

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