Research on Shandong Technology Data Allocation from the Perspective of Market-oriented Allocation of Data Elements

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Abstract. As one of the data elements, the market-oriented allocation of scientific and technological data elements plays an important role in promoting technological self-reliance and self-improvement. Based on theories such as market-oriented allocation of data elements, this study constructs an analysis framework for the market-oriented allocation of scientific and technological data elements. Taking Shandong Province as an example, the current situation of scientific and technological data in Shandong Province is summarized from the aspects of overall planning, basic element situation, configuration process and mode, and the advantages and shortcomings are analyzed. Finally, countermeasures and suggestions are proposed to promote the collection of scientific data, strengthen the construction of scientific and technological data entities and carriers, strengthen the formulation of policy standards, and strengthen supervision.

Keywords: scientific and technical(S&T) data, scientific data, data elements, Market-oriented Allocation, data opening, data sharing, Shandong province.

1   Introduction

As a new factor of production, data profoundly changes the mode of production, lifestyle, and social governance [1]. The CPC Central Committee and The State Council have repeatedly proposed to accelerate the cultivation and development of the data elements market and deepen the reform of market-oriented allocation of data elements. As one of the data elements, scientific and technological (S&T) data reflects the most rapid development of science and technology and plays an important role in promoting innovation efficiency and economic development [2]. At present, there are few research on the marketization of S&T data elements. Firstly, this study constructs the theoretical analysis framework of the marketization of S&T data elements and combs the present situation of S&T data in Shandong province based on this framework, this paper analyzes and summarizes the advantages and problems of Shandong S&T data management and puts forward some pertinent suggestions on the market-oriented allocation of S&T Data elements in Shandong province.

2   Study overview

2.1   Basic concepts

Data Elements.
Data elements are the key and core elements of the digital economy. Many scholars have defined the data elements [3-7]. To sum up, one is to identify what the data elements are. Data element is a collection of information, data, and knowledge, and is an economic resource. The second is to grasp that data elements are new production elements in the era of digital economy, and this "New" is mainly reflected in its characteristics. Thirdly, only by putting data elements into production and living, and promoting the whole chain of data value cycle, data elements can fully play an important role as production factors.

Many scholars have combed and summarized the characteristics of data elements. In addition to the characteristics of scale, diversity, high speed and value of "data", data elements also have the general attributes of production factors such as accumulation, circulation freedom and information security [8], at the same time, it has the technical-economic characteristics of non-competitive and low replication cost, which are fundamentally different from the traditional tangible production factors [9].

S&T data.
Combined with scholars on scientific and technological data [2-3,10-11], Science and technology government data [12-13]，in this study, scientific and technological data is defined as the collection of all kinds of information, data and knowledge related to science and technology activities, which can be divided into three types: scientific and technical literature , S&T government data and scientific and technical network data. Each type contains rich content, details as shown in Table 1. Since the S&T data involves many industries and fields, the scope of this research is limited to the S&T data collected and managed by the provincial S&T administrative departments and their directly affiliated units.

Public data resources refer to all kinds of data sets collected or generated by government departments and public enterprises and institutions carried out by public firms. The public data includes government data in scope [14-15].

Table 1. Specific types and contents of S&T data.

Type	Content
S&T litera-ture data	Periodical literature, papers, patents, standards, domestic and foreign scientific and technological reports, etc.
S&T gov-ernment data	S&T policy, S & T projects, S&T talents, S&T achievements, S&T awards, archives of S&T, S&T plan data /technology report, S&T services, S&T carrier data (research institutions, S&T platform, S&T park, S&T enterprises), S&T resources data (experimental animals, large instruments, germ plasm resources, biological samples), S&T statistics, S&T interactive data, popular science data, etc.
S&T network	S&T information of various industries and fields, reports related to S&T activi-

data	ties, etc.

Market-oriented allocation of data elements.
The market-oriented allocation of data elements is to give full play to the decisive role of market-oriented allocation and promote the transformation of the plan-led data flow within the same interest subject to the market-led allocation mode among different interest subjects. It is an important realization form for the allocation efficiency of data elements to be optimal [16]. As a kind of resource, the allocation mode of data mainly includes administrative allocation and free adjustment allocation by the market. The market allocation of government data can be divided into data authorization operation, data licensing development and application, data trading venues, and data asset certificate [17], In addition, data sharing and opening is also an important way of data market allocation.

2.2   Research status of S&T data

In this paper, CNKI and Wan fang database were used as the search sources, and the title or keywords as S&T data and S&T big data were accurately searched. The retrieval time was July 24,2023. After screening, a total of 65 documents related to S&T data were obtained. It involves various types of agriculture, medicine, forestry, geography, national defense, and S&T government data resources. The research topics mainly involve three aspects. The first is the discussion of the value and performance of S&T data. S&T data which has use value and symbolic value can be evaluated for value through indicators such as organizational credit [18]; Through data cleaning, entity alignment and other methods, the development of S&T big data value-added enrichment tools is developed [19]. The second is the open sharing and utilization of S&T data. The legal guarantee and establish the guaranteed mechanism of data development and utilization should be strengthened [20]; the data opening and sharing policies, formulate standards and integrate the ecological resources of government S & T data should be improved [21]; the unified sharing platform portal, and the concept of sharing among all should be built and established [22]. The third is S&T data platform research. For example, the BaaS platform suitable for the field of S&T data sharing [23], S&T data resource platform and metadata storage construction [2,24-26].

At present, the research and practical application of S&T data are in the initial stage [27]. In terms of regional research, there are too few studies on promoting and optimizing the market-oriented allocation of local data elements [28], No marketization of S&T data is involved. This provides the direction for the development of this study.

3   Market-oriented analysis framework of S&T data elements

3.1   Theoretical basis

Data lifecycle theory.
The core stage of the data lifecycle model includes data supply, data circulation, data application and data supervision. Among them, data supply mainly includes data generation, data collection and aggregation, and data governance; data circulation includes data release and sharing, data transaction, data authorization and operation; data application includes data utilization and reuse, etc.

Theory of market-oriented allocation.
Zhuo Tao designed the theoretical framework of market allocation of data elements, including four dimensions, that is data elements, data subject, data carrier and institutional mechanism, and put forward three typical data allocation modes [27]. Based on the data ontology and the data carrier, Ji Liang has constructed the theoretical framework of the market allocation of data production factors, including data demand, data supply and data transaction [29]. Weiling Wang has constructed a data factor market framework system, including data element market supply, data element market circulation, data element market application, data element market supervision, data element market system and data element market basis [30].

3.2   Analysis framework of market allocation of S&T data elements

Combined with the data life cycle theory and the market allocation theory, this report puts forward the analysis framework of the market allocation of S&T data elements (See Figure 1), which mainly includes S&T data elements, S&T data subject, S&T data carrier, S&T data system, and S&T data supervision.

The elements of S&T data are mainly S&T government data, S&T literature data and S&T network data generated, collected, and gathered by S&T administrative departments. The subject of S&T data includes the data supply subject, the data circulation subject, and the data application subject, such as the S&T data producer, the collector, the provider, and the data user [31]class. Data supply subject mainly include data producers, collecting parties and data providers; data circulation subject are all kinds of entities that ensure the orderly and safe data trading circulation transfer, including data exchange, data providers, data brokers, third-party professional service organizations and other entities involved in data trading circulation; data application entities are mainly data users and data developers.

The data carrier is the medium for storing the data, such as paper documents, electronic hard disk, and other physical carriers [32]. In the context of big data, the new generation of information technologies such as blockchain and cloud computing are rising rapidly, and the data is growing exponentially. The development of technology and economy has put forward higher requirements for the rapid processing of data. Traditional physical carriers such as paper documents show some disadvantages, and the data platform that can better adapt to the needs has become the mainstream. Data

platform becomes the carrier of data [33]. Scientific and technological data carrier is the technical environment carrying digital data. The most basic is the data platform, which carries the data collection, storage, processing, and application [29]. The data factor market system is a series of laws, regulations, standards, and norms formulated to ensure the efficient supply, circulation, and application of scientific and technological data elements, which includes not only relevant policies specifically for scientific and technological data, but also relevant policies for big data. Data factor market supervision mainly supervises and manages the data factor market registration, circulation safety and order, and credit system, mainly including the policies and regulatory subjects related to supervision.
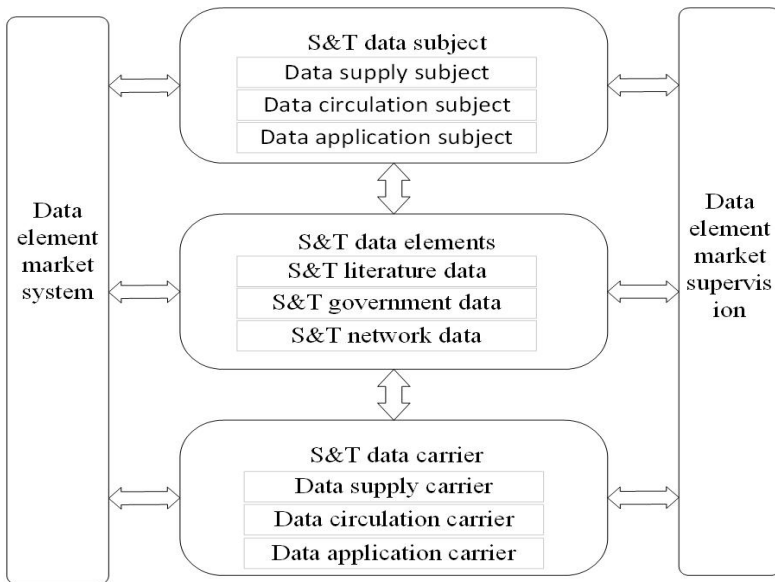

Fig. 1. Analysis framework of market allocation of S&T data elements

4   Current situation of S&T data element market in Shandong Province

4.1   Master planning

Shandong has put forward the work goal of "building the pilot zone of national data elements market allocation reform" in the Implementation Plan of Deepening the "Convergence and Use of Data" System in Shandong Province to Accelerate the Construction of Accelerating the Value of Data. Focusing on public data, Shandong Province proposed that "by 2025, the overall work of strong digital provinces will be in the first place, the reform of market allocation of data elements has made significant progress, and the public data sharing rate and opening rate will reach 99% and 30% respectively"[34]. The planning of S&T data is distributed in Shandong "Fourteenth

Five-Year" S&T Innovation Plan, focusing on the data aggregation and statistical monitoring related to S&T plan; for scientific data, "strengthening the data convergence and sharing of all kinds of scientific and technological innovation tasks; accelerating the construction of S&T cloud platform, and improving the statistics and monitoring mechanism of S&T data; supporting the exploration of international scientific research mechanism, and promoting the cross-border flow of information and data elements related to scientific research and auxiliary; and promoting the open sharing of scientific data"[35]. It is also proposed to strengthen the sharing of S&T data resources and achieve the interconnection and interoperability of S&T achievements, reports, literature, intellectual property rights, technical standards, and other information [36].

4.2   Basic elements

S&T data elements.
The data of S&T government data in Shandong province mainly includes S&T policy, S&T plan project data, achievements, S&T reports, S&T platforms, S&T experts, scientific research instruments, government open data and public interaction data. The data of the S&T platform mainly includes academician workstations, key laboratories, technology innovation centers, international S&T cooperation bases, incubators, mass innovation space and accelerator.

S&T network data mainly includes S&T news, local S&T trends, media focus and related news videos.

S&T literature data integrates database literature resources such as CNKI, Wan fang, NSTL, Shang Wei S&T report and global product samples, with a resource of nearly 1.2 billion pieces.

Data carrier.
S&T data carrier of Shandong mainly involves all kinds of data platforms such as the official website of Department of Science and Technology of Shandong, WeChat public account and its affiliated institutions, and no data trading institutions participate. The type of carrier is mainly data supply carrier and data circulation carrier. See Table 2 for specific details.

Table 2. S&T data carrier of Shandong Province

Name	The carrier type
Official website of Department of Science and Technology of Shandong Province	Data supply carrier
WeChat of Shandong Science and technology	Data supply carrier
Science and Technology cloud platform of Shandong Province	Data supply carrier
Shandong Province scientific and technological achievements transformation	Data supply carrier
Shandong Science and Technology Report Service	Data supply carrier
Shandong science and technology literature service	Data supply carrier Circulation carrier

Shandong science and technology archives management	Data supply carrier
Shandong Public data Open	Circulation carrier

Subject of S&T data.

The main body of S&T data in Shandong Province is mainly the Department of Science and Technology of Shandong Province and its affiliated institutions. As shown in Table 3.

Table 3. Main S&T data subjects in Shandong Province

Science and technology data subjec	Data content	Subject type
Department of Science and Technology of Shandong Province	S&T government data S&T network data	Supply Supply
Shandong Institute of S&T Information	S&T government data S&T literature data	Supply; Application Supply; circulation; application
Shandong Province Innovation and Development Research Institute	S&T government data	Supply
Shandong Provincial Big Data Bureau	Public data (S&T government data)	Circulation
Individual, legal entity, etc.	S&T government data S&T literature data S&T network data	Supply; Application Application Application

Institutional construction.

As shown in Table 4, Shandong has successively issued Shandong Province Regulations on Big Data Promoting Development, Shandong Province Public Data Opening Measures, and other documents, putting forward plans and requirements centering on the cultivation of data elements market, the development and application of data resources, government data, public data, etc., and actively promoting data opening and application.

Table 4. Main policies of S&T data in Shandong Province

Time	Policy name	Primary coverage
2022	Regulations of Shandong Province on Promoting the Development of Big Data	Put forward requirements around data resources, development, and application, etc.
2020	Administrative Measures of E-government Affairs and Government Affairs Data of Shandong Province	Standardize government data management and application services
2021	Outline of the 14th Five-Year Plan for National Economic and Social Development of Shandong Province and 2035	Cultivate the data factor market, establish the basic system and standard norms, and build the Shandong Province big data trading center
2021	Construction Plan of the fourteenth Five-year Plan of Shandong Province	Clarify the development goals and indicators, and implement the digital ecological cultivation project
2022	"Public Data Open Measures of Shandong	Standardize the scope of application,

	Province"	development and utilization, security, and protection of public data
2023	Notice of People's Government of Shandong Province on Printing and Issuing the Implementation Plan of Digital Government Construction in Shandong Province	Deepen the opening of public data, explore the authorized operation of public data; explore the establishment of the right confirmation and registration of public data assets
2021	Detailed Rules of Public Data Sharing in Shandong Province (Trial)	Public data sharing work system, collection, and aggregation, etc.
2022	Detailed Rules for Public Data Opening of Shandong Province (Trial)	Public data open work system, open and audit, data acquisition and audit, data utilization and supervision and guarantee, etc.
2022	Several Measures on Deepening Reform and Innovation and Promoting the High-quality Development of the Digital Economy	Explore the market-oriented mechanism of data elements. Focus on data element convergence, sharing and opening, and integration of data elements
2021	Shandong 14th Five-Year Science and Technology Innovation Plan	Promoting the open and sharing of scientific data. Strengthen data convergence and sharing. accelerating the development of a science and technology cloud platform
2019	The Implementation Rules of Scientific Data Management in Shandong Province	Scientific data center system construction, data collection, etc.

In terms of S&T data, the 14th Five-Year Plan for Scientific and Technological Innovation has been issued, which plans S&T data and scientific data. More specifically, policies related to S&T reports and scientific data have been issued, such as the Implementation Opinions of Shandong Provincial Department of Science and Technology on Accelerating the Establishment of the S&T Report System [37]"Shandong Province Science and Technology Plan Science and Technology Report Management Rules" and "Shandong Province Science Data Management Implementation Rules".

In terms of standards, as shown in Table 5, Shandong has issued more than 20 standards, including local standards and group standards. The content involves public data, government information resources, government service platform, data product registration and data element enterprise evaluation, and there is no relevant standard specifically for S&T data. In the local standards, with public data as the theme, Shandong Provincial Big Data Bureau led the drafting.

Table 5. Relevant standards of Shandong Province

Standard name	Standard number
Public Data Opening- -Part 1: Basic requirements	DB37/T3523.1-2019
Public Data Opening Part 2: Guide for data desensitization	DB37/T3523.2-2019
Public data opening- -Part 3: Open evaluation index system	DB37/T3523.3-2019
Catalogue of Government Information Resources-Part 1: Coding rules	DB37/T3521.1-2019
Government affairs information resources catalogue- -Part 2: Core metadata	DB37/T3521.2-2019
Catalogue of Government Affairs Information Resources- -Part 3: Compilation Guide	DB37/T3521.3-2019
Overall architecture of the government affairs data resource system	DB37/T 3520-2019

Government affairs information resources, data exchange norms	DB 37/T 3522-2019
Government affairs information resource data service interface specification	DB37/T 4225-2020
Shandong Provincial Government Affairs Service Platform- -Part 1: Basic function requirements	DB37/T3448.1-2019
Government affairs service Platform- -part 2: Basic data element directory	DB37/T3448.2-2019
Government affairs service Platform- -Part 4: Basic data specification	DB37/T3448.4-2019
Public data is open, application and development specification	ZH 012-2019
Public data is open, and data management norms exist	ZH 009-2019
Public data to open the metadata specification	ZH 010-2019
Public data is open, and the data display is standardized	ZH 011-2019
Data product registration information description specification	T/SDME 01-2022
Data product registration business process specification	T/SDME 02-2022
Data element-type enterprise evaluation specification	T/QBDA 3005-2023
Data element sex enterprise evaluation specification	T/SDDITAI9003-2023

Market regulation of data elements.

"The Shandong big data development to promote regulations on the Shandong public data open work rules (trial) "" Shandong province public data sharing work rules (Trial) " all involve data elements market regulation, such as the provisions of the public security departments and units in the data security related supervision and management, data resources market transaction supervision and management of regulatory responsibilities [38]. According to the above provisions, the supervision subjects, and contents of S&T data in Shandong Province are shown in Table 6.

Table 6. Market supervision of Shandong S&T data

Data supervision subject	Data regulation content
People's Government of Shandong Province	Data resources market transaction
	Public data open, sharing and utilization work
Shandong Provincial Big Data Bureau	Data open quality monitoring
	Unified platform security operation and risk monitoring
	Data security supervision and management
"Chief Representative" of public administration and service agencies	Supervision and management of the public data of the unit
Public administration and service agencies (Department of Science and Technology of Shandong Province, etc.)	Service application monitoring
	Data security lifecycle management
	Security of data opening
Public Security Department of Shandong Provincial, etc.	Supervision and management related to data security
Office of the Cyberspace Affairs Commission of Shandong Provincial	Security, related supervision, and management of network data
Relevant competent authorities	Scientific data full life cycle management, quality, and safety

In relevant practice, Department of Science and Technology of Shandong Province has issued some S&T data management policies. For example, for the scientific and technological activities of applied research and technology development, the quality, contribution and impact of landmark achievements such as scientific data and S&T reports should be pay attention [39].

Shandong Institute of Scientific and Technical Information shall receive the S&T reports generated by S&T plans, review the form, content, and classification of S&T reports; conduct sharing and utilization of S&T reports according to the authority, and supervise and analyze the utilization of S&T reports.

4.3   Market allocation process and mode of S&T data elements

Process and Mode.
With different types of S&T data, the market allocation methods and processes are also different. Figure 2 shows the configuration process and mode of S&T data elements in Shandong Province. In terms of S&T government data configuration, individuals, legal persons and other organizations submit S&T data through the platforms owned by Department of science and technology of Shandong Province and other units (such as Science and Technology cloud platform of Shandong Province).Department of science and technology of Shandong Province carried out declassification according to certain specifications and standards, opened it to data utilization subject through the Shandong provincial public data open platform, the data utilization subject will feed back the utilization of scientific and technological data, and release the applications generated by using scientific and technological data to the data open platform. At the same time, according to the application of other public management and service institutions, Department of science and technology of Shandong Province carried out data sharing through the Shandong integrated big data platform.
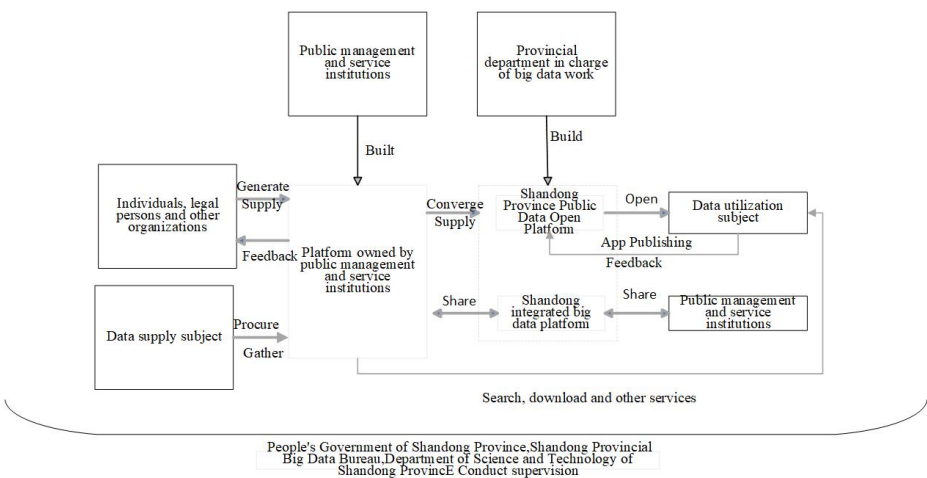

Fig. 2. Market allocation process and mode of S&T data elements in Shandong Province

Data opening includes unconditional opening, conditional opening and not opening. Data provision includes data download, service interface, data sandbox and privacy computing. For those with conditional opening, Department of Science and Technology of Shandong Province shall sign a public data open utilization agreement with the data utilization subject after the examination and approval. Data sharing includes unconditional sharing, conditional sharing, and no-sharing.

In terms of S&T literature data and S&T network data configuration, Department of Science of Shandong Provincial, Shandong Institute of Scientific and Technical Information obtain data from media, Wan fang and other data suppliers through collection and procurement, and provide browsing, retrieval and download services to data utilization subject through their own platforms.

Related cases.

In terms of S&T government data open, as of September 2023, Department of Science of Shandong Provincial has 23 data directories with more than 23000 items, all of which are opened unconditionally in Shandong Public data Open. Data interface, table, and xml are the main data format.

In terms of S&T government affairs data sharing, all public management and service institutions in Shandong province carry out S&T data sharing through the integrated big data platform of Shandong Province. For example, Shandong Provincial Department of Industry and Information Technology applies for the directory of high-tech enterprises and the record information of academician workstation of Shandong Province through this platform.

In terms of S&T literature data, Shandong Institute of Scientific and Technical Information has purchased data resources such as Wan fang, CNKI, and Wei Pu, and carried out free literature retrieval, browsing and download services for researchers in the province through the construction of Shandong S&T literature sharing service platform and 11 service stations.

4.4   Advantages and weaknesses

Advantages.

(1) The overall plan of public data and S&T data is relatively clear. Shandong has issued relevant plans and measures around the opening and sharing of public data and S&T data, strengthened the top-level design, defined the steps and measures, and laid the early foundation for the marketization of S&T data elements.

(2) S&T data subjects are relatively concentrated. Shandong Province S&T plan projects, S&T experts and platform bases and other S&T government data are centrally gathered and provided one-stop services through Science and Technology cloud platform of Shandong Province, which is operated by Department of Science and Technology of Shandong Province. S&T archives, S&T reports, scientific data and S&T literature are all handled by Shandong Institute of Scientific and Technical Information. The user-oriented S&T data subject is relatively concentrated.

Shortboard.

(1) The convergence of S&T data elements is not complete, and there are short-comings in scientific data work. Scientific data is an important type of S&T data. Strengthening the management of scientific data is of great significance to support scientific and technological innovation and economic and social development. Although Shandong province has issued relevant detailed rules, the work of collecting and exchanging scientific data for S&T plans has not yet started. A large number of scientific data are scattered in the hands of researchers, and there is a lack of S&T data aggregation.

(2) S&T data carriers are relatively dispersed. S&T data elements are scattered in multiple data carriers such as Science and Technology cloud platform of Shandong Province, Shandong Science and Technology Report Service, and Shandong science and technology archives management. Unified user login has not been realized among the platforms, which is not conducive to the collaborative management and service of S&T data.

(3) The construction of institutional standards still needs to be strengthened. Specific policies for scientific and technological data need to be formulated. For example, in terms of data ownership, Guangdong stipulates that "the ownership of government data resources belongs to the government"[40], Jiangsu stipulates that "public data has public attribute; public management and service institutions accept the guidance of relevant departments of state-owned assets supervision at the same level"[41], Shandong has not yet been defined. In terms of standards, although local and engineering standards for public data have been issued, no relevant standards for S&T data in Shandong.

(4) The supervision of S&T data market needs to be refined urgently. Relevant regulatory requirements are relatively macro, involving many regulatory subjects, and no effective coordination mechanism has been established. In terms of regulatory content, the work of data assets management will be carried out soon. Whether to expand the regulatory content and increase the supervision of state-owned assets remains to be discussed.

(5) Insufficient market allocation of S&T data elements. A large number of S&T data is gathered in Science and Technology cloud platform of Shandong Province and is shared and opened through the Shandong Province's integrated big data platform. No deep mining has been carried out and corresponding data products have been formed. The authorized operation of S&T data, the development of data licensing, the registration of data intellectual property rights, and data transactions have not been carried out. The supporting role of decision-making is insufficient, and the provincial S&T data management and marketization system has not yet been formed.

5   Suggestions on market-oriented allocation of S&T data elements in Shandong Province

Shandong province has carried out some work around the marketization of S&T data elements, promoting the aggregation, circulation, and application. In the next

step, Shandong should carry out corresponding work centering on strengthening the support of policies and standards and make greater efforts to promote the marketization of data elements.

(1) Promoting the exchange of scientific data to make up for the lack of S&T data. Relevant systems will be further established and improved around the management of S&T plan projects, property right separation of scientific data elements, circulation, and income distribution [42]. Policy, capital, and talent support should be strengthened, the development of scientific data management system in Shandong Province should be accelerated, the work of scientific data exchange of S&T plan in Shandong Province should be carried out as soon as possible. The scientific data governance system with the participation of market entities engaged in scientific data management and circulation should be established, so that all parties can get corresponding feedback on their rights and interests [42].

(2) Strengthening the construction of the subject and carrier of S&T data. According to the model of Jiangsu Province Science and Technology Resources Coordination Service Center and Shanghai S & T innovation resource data center, a unified scientific and technological data management body across the province should be established. The interconnection between S&T data carriers should be further strengthened, strengthening the collaborative management of S&T archives, S&T reports, and scientific data [43], The development of S&T data products and services should be accelerated.

(3) Strengthening the formulation of policies and standards for S&T data. The unified policies for the management and market allocation of S&T data should be formulated. The collection, processing, and review, sharing and authorized operation of S&T data should be clarified. Supporting policies for market-oriented operation of S&T data around finance, finance, taxation, and Industry should be formulated. Refer to the operation mechanism of separate property rights such as data resource holding right, data processing uses right and management right of data products, legislation on data property rights should be promoted to further clarify the ownership issue.

Assessment methods and standards for the marketization of scientific and technological data should be made [44]. Guangdong has issued group standards related to S&T data. Using Guangdong for reference, S&T data group standards, industry standards and local standards for S&T data platform, data analysis, data governance, data operation, data registration should be issued.

(4) Strengthening the supervision of S&T data. Specific regulatory policies for S&T data should be introduced. The regulatory subjects, regulatory contents and regulatory measures should be further refined. The establishment of a coordination mechanism for the supervision of S&T data market should be explored.

(5) Establishing a provincial S&T data management and marketization system, and strengthening data aggregation, governance, and application. The establishment of mechanisms for intellectual property registration, entrusted operation, asset evaluation and market trading of S&T data should be explored. Scientific data product registration and data trading through Shandong data trading platform should be carried out.

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