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RESEARCH ARTICLE

Commercial Data Governance: Developing Typology-Based Intellectual Property Protections

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ABSTRACT

With the rapid advancement of digital technologies, commercial data have emerged as fundamental elements of the digital economy, demonstrating increasing significance. Characterized by their intangible nature, non-rivalry, and non-excludability, commercial data exhibit substantial compatibility with intellectual property subject matter. The inherent flexibility of intellectual property regimes, coupled with the convergent legislative values of data protection and intellectual property governance, establishes both the feasibility and legitimacy of protecting commercial data within intellectual property frameworks. This context renders the introduction of a categorized protection approach that is theoretically valuable and practically significant. Within the framework of the intellectual property rights system, a classified protection system can be established based on the different characteristics of commercial data. For data collections that are original selections, the protection rules for compilations in copyright law can be applied. For commercial data that meet the requirements of secrecy, value, and confidentiality, protection can be provided through the trade secret system. For general commercial data that have been deeply processed but lack originality or secrecy, exploring the establishment of a new type of data intellectual property rights system is necessary in order to achieve a balance of interests by granting limited exclusive rights. Such differentiated protection mechanisms would systematically address the heterogeneous nature of commercial data assets while maintaining appropriate incentives for data production and circulation in digital markets.

KEYWORDS

Commercial data, Data classification, Data protection, Intellectual Property

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주제어

상업 데이터, 데이터 분류, 데이터 보호, 지식재산권

1. Introduction

With the rapid development of digital technology, the commercial value of data has become increasingly prominent. The rational protection and efficient utilization of data have become a focal point for governments and enterprises worldwide. As a new type of production factor constituting productivity, commercial data holds significant economic value. The efficient circulation and full utilization of commercial data are key to enhancing productivity levels and driving industrial transformation. The improvement of "digital productivity" requires the safeguard of sound laws and governance. Establishing rational and effective rules for the production and circulation of commercial data and providing effective legal protection pathways for commercial data operators have become urgent issues that need to be addressed at present.

In China, data, as the core element of the digital economy, has been elevated to a national strategic level in terms of its importance. In terms of policy orientation, the Third Plenary Session of the 20th Central Committee of the Communist Party of China clearly proposed to accelerate the construction of a system and mechanism to promote the development of the digital economy, emphasizing the establishment of systems for the identification of data property rights, market transactions, rights and interests distribution, and interest protection, providing policy guidance for the healthy development of the data element market. The "Opinions on Building a Basic System for Data to Better Play the Role of Data Elements" (referred to as the "Data Twenty Articles"), released in 2022, further clarified the positioning of data as the "fifth element," laying the foundation for the construction of the data property rights system. Within the national intellectual property strategy layout, the "Outline for Building a Strong Intellectual Property Country (2021-2035)" explicitly proposed to study and construct rules for the protection of data intellectual property rights, providing top-level design for data intellectual property protection. In 2023, the National Intellectual Property Administration of China issued the "2023 National Intellectual Property Administrative Protection Work Plan," further emphasizing the comprehensive improvement of intellectual property protection effectiveness to support the construction of a strong intellectual property country, safeguard the entire chain of innovation and entrepreneurshintellectual property, and promote high-quality economic and social development.

In practice, under the active promotion of the China National Intellectual Property Administration, pilot work for the protection of data intellectual property rights has been actively promoted nationwide and has achieved important progress. In 2022, the "Notice of the Office of the National Intellectual Property Administration on Determining the Pilot Places for Data Intellectual Property Work" designated eight places, including Beijing, Shanghai, and Jiangsu, to conduct pilot work for data intellectual property. In 2024, nine additional pilot regions, including Tianjin, Hebei, and Shanxi, were added. It is evident that in China, protecting commercial data

through the intellectual property system has become an irresistible trend.

The South Korean government places high importance on the digital economy and vigorously promotes the development of areas such as 5G network construction, artificial intelligence talent cultivation, "data dams," artificial intelligence government, and intelligent medical infrastructure. In addition, South Korea has achieved remarkable success in fields such as e-commerce, online social software, and internet gaming. Driven by the digital economy, South Korea has established a mature data protection legal system. In 2011, South Korea enacted the "Personal Information Protection Act", which is mainly applicable to the protection of data privacy and serves as the general law for data protection in South Korea. With the transformation of industries and the development of the digital economy, in October 2021, the South Korean Ministry of Science and Information and Communication Technology (MSIT) announced that the State Council meeting had passed the "Act on the promotion of data industry and the activation of data use" which aims to establish necessary matters for promoting data production, transactions, and utilization, to create economic value from data, lay the foundation for the development of the data industry, and contribute to improving the living standards of the people and the national economic development. It is evident that South Korea's approach to data protection has evolved from a focus on the protection of data personality rights to a balance between data personality rights and property rights.

Although South Korea maintains a robust legal framework for data protection, existing regimes exhibit significant limitations in addressing the emerging challenges posed by commercial data. Notably, commercial data shares key characteristics with traditional intellectual property subject matter, suggesting that intellectual property mechanisms may offer a viable pathway for its protection. Against this backdrop, this paper seeks to establish the normative justification for recognizing commercial data as a protectable subject matter under intellectual property law. To advance this proposition, the analysis proceeds in three stages. First, it critically examines the deficiencies of current legal frameworks in safeguarding commercial data. Second, drawing on intellectual property theory, it demonstrates the doctrinal coherence of treating commercial data as an intellectual property-protectable asset. Third, it proposes a tailored intellectual property protection model that accounts for the unique attributes of commercial data.Central to this approach is the systematic classification of commercial data based on its typological features. Such categorization not only clarifies the relationship between commercial data and conventional intellectual property objects but also enables the development of differentiated protection modes within the intellectual property framework. Ultimately, this analytical framework aims to contribute to the construction of a more coherent and effective intellectual property protection system for commercial data.

2. The Necessity Analysis of Legal Protection for Commercial Data

In the contemporary digital era, commercial data has emerged as a core asset in corporate competition. Its unique characteristics, such as intangibility, non-exclusivity, and non-rivalry, enable it to create value while also exposing it to the risks of misuse and infringement. Therefore, an in-depth analysis of the necessity for legal protection of commercial data is of paramount importance. On the one hand, it is essential to clarify the characteristics of commercial data to comprehend its similarities and differences with traditional intellectual property. On the other hand, examining the value of legal protection for commercial data can help assess whether such protection can bring positive impacts to society.

2.1. Analysis of the characteristics of commercial data

Under Article 2 of South Korea's Basic Act on the Promotion of the Data Industry and Data Utilization, "data" is defined as information or materials obtained through observation, experimentation, investigation, or collection, or generated via information systems and software as prescribed in Article 2(1) of the Software Promotion Act, which can be processed by optical or electronic means. Notably, however, South Korean law does not provide an explicit statutory definition of "commercial data." In this context, South Korea can refer to the definition of commercial data in China. The State Administration for Market Regulation of China promulgated the Draft Amendment to the Anti-Unfair Competition Law in November 2022. Article 18 of the draft introduced a new clause on "Commercial Data", defining it as data that is "legally collected by business operators, has commercial value, and is subject to corresponding technical and management measures".

A close analysis of these legal provisions reveals that the recognition of commercial data as a protectable asset requires the simultaneous satisfaction of three constitutive elements: lawful collection by business entities within their legitimate operational spheres, demonstrable commercial value that confers competitive advantage, and the implementation of robust technical measures to ensure data integrity and control.[1)] This tripartite qualification framework intentionally constructs a doctrinal boundary between commercial data and other data categories, particularly personal data governed by privacy regimes and public data subject to open access principles, by anchoring its legal protection in distinctly market-driven considerations.

The nature of commercial data as aggregated information assets deployed for

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1) Liu Zhiqin, "Protecting commercial data from an Unfair Competition Law Perspective and Analysis of the 'commercial data clause' in the Draft Revision of the Anti-Unfair Competition Law," *Journal of Shandong University of Science and Technology, Social Sciences Edition*, Vol.25 No.3(2023), pp. 30-37.

strategic business purposes necessitates its conceptual differentiation from traditional property forms, manifested through three intrinsic juridical attributes: its non-material existence independent of physical substrates, its capacity for non-exclusive utilization across multiple entities simultaneously, and its non-rivalrous character that preserves utility regardless of consumption patterns. These ontological particularities not only challenge conventional property law dogmas but also demand the development of specialized regulatory approaches capable of addressing the unique tensions between data exclusivity and the fluid dynamics of digital market competition.

On the one hand, commercial data is fundamentally characterized by its intangibility nature. Commercial data is usually represented as a data set, which mainly exists in the computer network. It is in binary form and consists of a combination of 0 and 1. It has the characteristics that it cannot exist without the physical carriers such as servers and mobile terminals. The data is presented in the form of information displayed through application codes or programs.[2] It can be seen that there are similarities between commercial data and existing intellectual property objects (such as works, inventions, utility models, designs, trademarks, trade secrets, etc.), which are immaterial and intangible. It is precisely because of the immateriality of commercial data that it cannot be possessed and publicized like things, which leads to the need to rely on physical carriers such as servers and mobile terminals to generate, store and transfer. Due to the immateriality of business data, which is different from physical objects, it is objectively difficult to be monopolized by a specific subject. Therefore, commercial data has the characteristics of non exclusivity.

On the other hand, commercial data exhibits distinct non-rivalrous and non-excludable characteristics that fundamentally differentiate it from traditional tangible resources. Unlike physical assets that depreciate through use, commercial data can be simultaneously processed and analyzed by multiple entities within the same temporal-spatial context, or reused repeatedly by a single entity without diminishing its utility value. This non-rivalrous nature ensures that increased user numbers or varied utilization methods neither degrade the data's effectiveness nor create scarcity-induced competition. Furthermore, commercial data demonstrates pronounced non-excludability - absent legally constructed artificial scarcity through regulatory intervention, initial data holders typically cannot prevent third-party utilization once the data enters the public domain. The big data era has amplified this characteristic, as near-zero marginal costs for data replication and dissemination make exclusion particularly challenging. Without legal mechanisms creating artificial scarcity, originators' rights over commercial data remain vulnerable to misappropriation. Consequently, the inherent non-rivalrous and non-excludable nature of commercial data necessitates the development of a

2) Mei Xiaying, "The Legal Attributes of Data and Its Civil Law Positioning," *China Social Sciences*, No.9(2016), pp. 164-183.

distinct legal protection regime that fundamentally differs from traditional property rights frameworks governing tangible assets.

2.2. Value-based analysis of legal protection for commercial data

In the digital economy era, commercial data has emerged as a critical factor of production whose legal protection derives necessity from its unique economic attributes and social value. From a jurisprudential perspective, the legal protection value of commercial data manifests principally across three dimensions.

Primarily, commercial data possesses substantial economic worth, frequently analogized to "the petroleum of the 21st century" and recognized as the fountainhead of competitive advantage in the digital age - a reality that renders the examination of its civil legal implications particularly significant.[3] As intellectual artifacts requiring considerable human and material investment for collection and systematization, commercial data exhibits the fundamental characteristics of property rights objects. Data holders secure market competitiveness and generate economic benefits through the collection, analysis, processing, and utilization of commercial data, whereas inadequate legal protection may result in improper acquisition or misuse, thereby not only infringing upon data holders' legitimate rights but also stifling corporate innovation investment, ultimately compromising the healthy development of market economies. Acknowledging this urgency, South Korea has implemented significant legislative reforms, most notably the enactment of the Framework Act on the Promotion of the Data Industry and Data Utilization in 2021 and the incorporation of data protection provisions in Article 2(1) of the amended Unfair Competition Prevention Act (2023). These developments demonstrate South Korea's recognition of the imperative value of legal protection for commercial data, reflected through a series of regulatory measures designed to facilitate data utilization while providing incentives for data collection and storage processes.

Secondly, the legal protection of commercial data serves the crucial function of maintaining market order. The non-excludable nature of data renders it particularly vulnerable to free-riding behaviors, where competitors may engage in data scraping or misappropriation to obtain commercial data - practices that not only undermine fair competition but may also constitute unlawful acts of unfair competition. By establishing clear boundaries for data acquisition and usage while defining ownership rights over commercial data, the law helps delineate the respective rights and obligations of different entities throughout the data lifecycle (including collection, utilization, and dissemination). This legal clarity prevents disputes and chaos arising from ambiguous entitlements, thereby ensuring stable market operations and preserving a well-ordered competitive environment. The regulatory

3) Shin Bong Geun, "Civil Legal Protection and Attribution of Data Transactions," *Kyungpook National University Law Journal*, Vol.85(2024), p. 188.

framework essentially creates artificial scarcity through legal means to counteract the natural non-excludability of digital information, addressing the market failure that would otherwise occur in the absence of such protective measures while still permitting legitimate forms of data sharing and utilization that benefit the digital ecosystem as a whole.

Finally, the legal protection of commercial data necessarily involves balancing competing societal interests. Excessive protection may create artificial barriers to legitimate data flows, thereby diminishing overall social utility, while inadequate safeguards risk enabling data misuse that compromises both individual privacy and business confidentiality. This fundamental tension requires legal frameworks to establish an equilibrium between data protection and circulation - a calibrated approach that must simultaneously secure holders' legitimate rights while facilitating reasonable data utilization to maximize societal welfare.

3. Feasibility Analysis of the Intellectual Property Protection Path for Commercial Data

Commercial data possesses substantial economic value, and in practice, data holders frequently employ contractual mechanisms to safeguard their interests and prevent unauthorized acquisition. A prominent example includes Internet platforms typically employ "robots.txt" protocols as a technical standard to communicate access permissions to web crawlers, explicitly specifying which website content may be crawled and indexed, while prohibiting excessive or repetitive scraping activities that could potentially disrupt normal server operations and compromise website performance.[4)]

However, contractual approach to commercial data protection exhibits inherent limitations stemming from data's non-excludable and non-rivalrous nature, which significantly constrain originators' ability to effectively monitor and control data through contractual means alone. Following data transactions, recipients obtain complete control over the acquired data and may freely disseminate it to third parties, unless the original holder implements restrictive technological measures—a requirement that often proves impractical and frequently results in data entering public circulation. This fundamental constraint has prompted legal scholars to advocate for recognizing commercial data as a novel form of property right, endowing data operators with absolute and exclusive entitlements analogous to traditional real rights in rem.[5)] Nevertheless, the intangible characteristics of data create fundamental incompatibilities with conventional ownership doctrines

4) Cao Liping, "Bot Agreements as a Dimension for Assessing the Legitimacy of Conduct Based on Business Ethics-A Review of the Unfair Competition Dispute between Beijing ByteDance Technology Co., Ltd. and Beijing Weimeng Chuangke Network Technology Co., Ltd.," *Law Application*, No.5(2023), pp. 95-104.

5) Long Weiqiu, "The Construction and System of a New Type of Data Property Rights", *Forum on Political and Legal Sciences*, Vol.35 No.4(2017), pp. 63-77.

developed for tangible assets, raising significant theoretical challenges regarding the legitimacy of propertization.[6)]

Given the inherent limitations of property rights and contractual mechanisms in adequately protecting commercial data, coupled with the demonstrable alignment between commercial data and intellectual property subject matter, incorporating commercial data within existing intellectual property frameworks emerges as both theoretically coherent and practically viable.

3.1. Commercial data conforms to the object attribute of intellectual property

First, the objects of commercial data and intellectual property are both information. The essence of the object of intellectual property is a kind of property information. The biggest difference between intellectual property and tangible property is that intellectual property is the right to some knowledge and informatio n.[7)] On the other hand, there is also a close relationship between commercial data and information. As an electronic symbol in the form of bits, commercial data is the carrier of information, and information is the specific expression of data content.[8)] As the object of business data, information has the characteristics of fixity, independence, process and knowledge compared with business data. Information is fixed on the commercial data carrier, but at the same time it is independent, and can exist without the carrier. It can be transmitted in electronic or non-electronic forms to reflect specific content.[9)] Therefore, the information characteristics of commercial data provide an important basis for regulating relevant data behaviors and protecting relevant rights and interests through the intellectual property legal system.

Secondly, the objects of commercial data and intellectual property rights are intangible and have the characteristics of immateriality. Different from the natural exclusivity of possession of tangible objects, the law protects the exclusive right of the obligee to control the tangible objects, which only needs to protect possession. commercial data and intellectual property object (information) cannot naturally exclude the possession of others. While the obligee possesses it, others can also possess and use the same information at the same time.[10)] It is an important embodiment of the immateriality of the object of intellectual property that physical

6) Hwang Won Jae, “The Need to Establish General Principles for Attribution of Data Rights - Focusing on Content and Direction of ALI-ELI Data Principles,” *Korea Law Review*, Vol.106 (2022), p. 291.

7) Zheng Shengli & Yuan Yong, “From Intellectual Property to Information Property—The Protection of Property-Related Information in the Knowledge Economy Era,” *Intellectual Property*, No.4(1999), pp. 7-10.

8) Xie Yuanyang, *Private Law Protection of Personal Information*, China Legal System Publishing House, 2016, pp. 4-6.

9) Han Xuzhi, “The Ambiguous Use of the Category of Information Rights and Its Consequences—An Analysis Based on the Confusion of Information and Data,” *Journal of East China University of Political Science and Law*, Vol.23 No.1(2020), pp. 85-96.

10) Liu Jiarui, “On Intellectual Property and the System of Possession,” *Electronic Intellectual Property*, Vol.2(2004), pp. 14-18.

possession cannot be realized through the physical form, and the use of the object is nondestructive.[11] Therefore, the object (information) of commercial data is highly consistent with the object of intellectual property such as works, trademarks, inventions, etc. at the non-material level.

Finally, compared with the sustainability of property ownership, the objects of commercial data and intellectual property have the characteristics of time, which shows that the legal protection period is not sustainable, but has a certain time limit. Once the time limit specified by the law is exceeded, it will no longer be protected. As far as property ownership is concerned, as long as the object is not damaged or lost, the property ownership of the object can exist all the time. However, for intellectual property, it is a property right formulated by law based on the needs of public policy. If the law stipulates that the obligee can always enjoy this right, it means that the public always needs to pay for it before it can be used, which hinders the subsequent use of its object by the public and forms excessive protection.[12] The objects of commercial data and intellectual property are both non-material. Therefore, unlike the natural timeliness of property rights, the protection period also has a legal period limit. For example, the EU database protection directive sets a 15-year duration for the protection of special rights in databases, which stipulates that the special rights in databases are obtained from the date of completion of database production, and are postponed for 15 years from January 1 of the year following the date of acquisition, and expire upon expiration.[13]

The limited protection period of commercial data object is reasonable. In the era of digital economy, commercial data is generated and replaced at a rapid speed, and commercial data information shows stronger timeliness rather than permanence. On the other hand, through empowerment, the relevant obligees of commercial data can be protected for a certain period of time, which is conducive to stimulating the continuous generation, processing and integration of data information. At the same time, timeliness also means that when the legal deadline is exceeded, the relevant commercial data will enter the common domain, and the public can use it freely, which is conducive to the dissemination and utilization of data and the maximization of the value of business data.

3.2. The intellectual property system is showing a trend towards openness

Throughout the development process of intellectual property, we can find that the intellectual property system has the characteristics of openness, which provides the feasibility for commercial data to become the object of intellectual property and be protected by intellectual property. With the development of science and technology,

11) Wu Handong, *Intellectual Property: General Theory*, 4th Edition, China Renmin University Press, 2020, p. 35.

12) Wang Qian, *Intellectual Property Law Tutorial*, 7th Edition, Edit. by Wang Liming, Beijing: China Renmin University Press, 2021, p. 12.

13) Article 10, Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases.

more and more objects have been included in the protection of intellectual property, such as trademarks, trade secrets, geographical indications and so on. Taking trademarks as an example, in the mid-19th century, trademarks were not included in the field of intellectual property protection, or even recognized as property. With the increasing recognition and use of trademarks in commercial practice, especially in international trade, the demand for trademark protection is increasing. Bilateral and multilateral treaties began to include trademarks, which promoted domestic legislation. Where the trademark system has not yet formed, in practice, trademark owners often seek protection through the design and copyright system. Based on the above logic, trademarks are gradually included in the scope of industrial property rights and become the object of intellectual property rights.[14] The evolution path of analogy trademark into the intellectual property system, commercial data has value, and judicial practice has gradually begun to use the intellectual property system to solve data disputes. The inclusion of commercial data into the intellectual property category conforms to the historical evolution logic of industrial property.

On the other hand, China's current legislation adopts an open model, which provides interpretation space for commercial data to become the object of intellectual property rights. Article 123, paragraph 2, of the Civil Code stipulates that "other objects prescribed by law" can be included in the scope of intellectual property objects. Although according to the legal principle of intellectual property object, only after legal confirmation, intellectual achievements with unique value can become the object of intellectual property. However, with the development of the intellectual property system, the principle of absolute legality needs to be eased. In judicial practice, it is necessary to carry out expansive legislative interpretation to improve the intellectual property rights system.[15] In fact, during the formulation of the general provisions of the civil law, China also tried to take "data information" as the object of intellectual property rights, which was later deleted due to great controversy.[16] In March, 2021, the State Intellectual Property Office issued "the annual guidelines for promoting the high-quality development of intellectual property (2021)", which also proposed to study and formulate rules for the protection of intellectual property rights in new fields and new formats, such as big data, artificial intelligence, gene technology, etc. It can be seen that China's current civil legislation has provided the legal basis and basis for the path of data intellectual property protection.

14) Brad Sherman & Lionel Bentley, *The Making of Modern Intellectual Property Law: The British Experience (1760—1911)*, Peking University Press, 2006, pp. 202-204.

15) Yi Jiming, "Intellectual Property Legalism and Its Moderation—An Analysis of Article 123 of the General principles of Civil Law", *Intellectual Property*, No.5(2017), pp. 3-11.

16) Article 108 of the first review draft of the general provisions of the civil law of China in June 2016 clearly regards "data information" as one of the types of intellectual property objects.

3.3. Data property system and intellectual property legislative protection value convergence

The intellectual property system aims to stimulate innovation and improve efficiency, and the data property system also pursues this goal. By protecting data, we can encourage creative intellectual labor and capital investment in data, so as to promote the innovative use of data. Both data and intellectual property rights show the characteristics of public goods, which are non competitive and non exclusive. The so-called non competitiveness means that when the number of users increases, there is no need to provide additional resources. In other words, the marginal cost of adding an additional user is close to zero. If a commodity cannot be prevented from being used by others, it is difficult to charge for the use of the commodity, and failure to charge will lead to a lack of motivation to produce the commodity, which is the so-called incentive problem.[17)]

The most effective way to deal with the incentive problem of public goods is to create exclusivity through legal means. Among the numerous legal mechanisms regulating the distribution of social resources, the property right system is one of the most effective means to stimulate producers. Specifically, the law gives producers the right to specific goods and stipulates that other people may not use these goods in principle without the consent of producers. This arrangement aims to encourage producers to invest resources in the production of public goods through legal protection. The fundamental purpose of the intellectual property system is to solve the lack of incentive mechanism in the field of public goods, and protect and encourage the creation and application of intellectual achievements by granting exclusive rights for a certain period of time. Similarly, the core goal of data protection is to promote the efficient use of data resources, provide economic incentives for the generation of data, and promote the reuse and trading of data to deal with the problem of market failure. Therefore, the intellectual property system and data protection show similar value pursuit in legislation.

4. Proposed Approaches for Intellectual Property Protection of Commercial Data

The existing legal frameworks and policy instruments governing data have established fundamental definitions and basic institutional structures, thereby providing normative guidance for constructing data property rights regimes. Given the inherent characteristics of commercial data—particularly its intangible nature and non-depletable quality—the intellectual property (intellectual property) protection approach emerges as the most conceptually appropriate among available regulatory alternatives. Moreover, compared to constructing an entirely new

17) Ji Hailong, “The Private Law Positioning and Protection of Data,” *Journal of Legal Studies*, Vol.40 No.6(2018), pp. 72-91.

property rights system for data, resolving data-related disputes within the established intellectual property framework presents significantly lower legislative costs. The intellectual property regime's inherent adaptability and open-textured nature enable its operational mechanisms to effectively accommodate the core interests and protection demands inherent to commercial data, while maintaining systemic coherence with existing legal structures. This dual advantage of institutional efficiency and doctrinal compatibility positions the intellectual property approach as a pragmatically superior solution for commercial data governance.

4.1. Categorizing commercial data under intellectual property frameworks

At present, the academic and theoretical circles often adopt the "one size fits all" mode to discuss the data protection, and rarely discuss the data protection in combination with the characteristics of different data sets. This may not meet the diversified, complex and dynamic needs of the development of the data economy, resulting in the inability to protect new interests, or arbitrarily break the boundaries of rights. The principle of data classification provides a methodological approach for the intellectual property protection of commercial data. Within the framework of intellectual property law, commercial data can be categorized into special commercial data and general commercial data based on their aggregated structural characteristics and legal protection requirements.

4.1.1. Special commercial data

Special business data usually refers to those data with commercial value that have been collected by enterprises according to law and corresponding technical management measures have been taken, which are embodied in the compiled business data formed by the data holder's selection or arrangement of the data set and the confidential business data with confidentiality measures.

On the one hand, the compiled commercial data is a form of commercial data collection. At present, the academic circle has not formed a unified opinion on the definition of business data sets. The draft WIPO database convention defines a collection of commercial data as "a collection of independent works, data or other materials that are systematically or orderly arranged and can be accessed separately by electronic or other means". The description of commercial data sets in the EU database legal protection directive is basically consistent with the draft WIPO database convention. From this definition, it can be seen that commercial data collections can be formed only by meeting the characteristics of orderliness, independent access and aggregation, which are protected by law. However, the "TRIPS Agreement" defines commercial data sets as a kind of data compilation, and points out that "data compilation or other information compilation, whether in machine-readable form or other forms, should be protected as intellectual creation as long as it constitutes intellectual creation through the selection or arrangement

of its content".[18] It can be seen that under the definition of TRIPS Agreement, the business data set can be protected only if it meets the requirements of intellectual creation. Similar to the provisions of the TRIPS Agreement, at this stage, China mainly protects the collection of business data that shows originality by compiling works.

Compiled commercial data refers to systematically organized collections of dispersed data elements that business operators assemble through information processing technologies, ultimately manifested as intellectual creations in either electronic or non-electronic formats. Such intellectual creations belong to the information set with low data redundancy and high data independence formed after systematic integration.[19] The selection or arrangement of the compilation process reflects intellectual creation and meets the requirements of originality.

On the other hand, confidential commercial data refers to technical information, business information, and other commercial information that has been subject to appropriate confidentiality measures by the operator. Its essence is a collection of non-public commercial data. In practice, based on business needs, business strategies, privacy protection and other considerations, operators often take confidentiality measures for some technical information, business information and other business information to keep the data in a non-public state. Among them, technical information is often expressed as raw materials, structures, formulas, operation methods or steps, algorithms, computer programs or related document information related to technology.[20] In addition to technical information, commercial data mostly falls into the category of business information, such as the collection of user information collected by the Internet platform, including avatars, names (nicknames), career information, educational information and user-defined labels, which are typical business information.[21]

Confidential commercial data is different from the "business information" protected by traditional business secrets, which is expressed as a digital form of business secrets. The business information protected under the traditional trade secret system is mainly enterprise technical information, operation management system or business strategy methods, such as product formula, contract quotation, customer information, enterprise internal articles of association, etc.[22] In addition to the traditional business information digitization part, the protection of commercial data also includes the derivative data generated by enterprises on the basis of traditional original data using computer algorithms, such as the strategic

18) Article 10, paragraph 2, of TRIPS Agreement.
19) Pan YinSong et al., *Introduction to Computers*, Edit. Computer Science Series, 1st Edition, Chongqing University Press, 2020, pp. 220.
20) See the provisions of the Supreme People's Court on Several Issues concerning the application of law in the trial of civil cases involving infringement of trade secrets, Article 1, paragraph 1, of law interpretation [2020] No. 7.
21) Beijing Intellectual Property Court's. (2016). civil judgment Jing 73 min Zhong No. 588.
22) Cui Guobin, "New Wine in Old Bottles: The Trade Secret Path for Corporate Data Protection," *Political and Legal Studies*, No.11(2023), pp. 2-23.

information data generated by enterprises through in-depth processing and analysis of enterprise user basic data through big data model software, such as user preferences, quality and so on, which are conducive to the future development of enterprises. Compared with the original data, such data tend to have more commercial value and belong to the core competitiveness of enterprises.

4.1.2. General commercial data

General commercial data refers to other data that are collected by operators according to law and processed by technical means and have commercial value, but have not been creatively compiled by enterprises or have not taken confidentiality measures. The value of data comes from the knowledge information it contains or can be mined. The use of information has unlimited choices. The sum of these choices is the "potential value" of data.[23] Data has a network effect, that is, a positive feedback effect. The more users, the greater the amount of data generated. Data value mining can help enterprises improve production efficiency, improve product service quality, and thus attract more users.[24]

In the era of big data, more and more new data sets have been generated. The compilation of commercial data and confidential commercial data can not fully cover all types of business data, such as the general commercial data with great business value, which is formed by the user basic data collected by the network operation platform based on the service contract and processed and desensitized on the basis of the original data. Such data items are often from the public domain or in the public state, which can not meet the requirements of confidentiality and can not be protected as trade secrets. On the other hand, because the value of big data lies in its collective characteristics, when collecting certain types of data, enterprises often try to be as comprehensive as possible, and often fail to meet the requirements of originality in the selection and arrangement of content, which cannot constitute a compilation of works protected by copyright law.

Combined with the above analysis, the general business database refers to the general name of other forms of commercial data that do not meet the requirements of originality or trade secrets and are protected by proprietary laws. Such data are also data information products with high commercial value. Although the data items may come from the public domain, due to the labor invested by the operators in the process of collecting and processing the original data, they realize the separation between the data and the data subject through desensitization filtering and other technical means, so that the data can objectively become the object of business analysis, so as to mine the potential value behind the data. Such data processing

23) Kong Xiangjun, "Commercial Data Rights: A New Type of Industrial Property in the Digital Age —The Incorporation of Industrial Property and the Three principles of property Determination", *Comparative Law Studies*, No.1(2022), pp. 83-100.

24) Feng Zhe & Hu Haiyang, "Protection of Traditional Production Factor Rights and Construction of Data Rights Brought by New Technologies," *Shanghai Legal Studies*, Vol.5 No.1(2021), pp. 14-30.

means not only change the quality and latitude of the original data, but also add new value on the basis of the original data. According to Locke's labor property theory, for the competitive object of general business data, the operators should enjoy legitimate interests and be protected by law.[25]

4.2. Towards a typology-based intellectual property protection framework for commercial data

In the digital economy era where commercial data has emerged as a critical production factor, establishing systematic legal protection frameworks requires urgent scholarly attention. This study proposes a typology-based intellectual property protection system that categorizes commercial data into: (1) compiled datasets (copyright protection), (2) trade-secret-eligible data meeting the three statutory requirements (secrecy, value, and reasonable measures), and (3) processed general data (sui generis intellectual property rights). Such differentiated regulatory architecture enables precise legal responses while balancing protection-utilization tensions, ultimately providing sustainable institutional support for data-driven economic development. The analysis contributes to ongoing debates about adapting intellectual property systems to digital assets by demonstrating how existing legal categories can be systematically deployed to address commercial data's unique characteristics.

4.2.1. Copyright protection mode of compiling commercial data

Through the systematic and orderly compilation of commercial data to meet the requirements of originality, the resulting commercial data can be regarded as a whole and protected by copyright law as a compilation work. China's current copyright law clearly stipulates that "a work that compiles a number of works, fragments of works, or data or other materials that do not constitute a work, and whose content selection or arrangement reflects originality is a compilation work". The copyright law does not protect facts and data that are not original. However, if the data collector can make original contributions to the selection, arrangement and integration of data, the commercial data set can be protected by copyright as a compilation work, and the unauthorized use of the commercial data set by others will constitute infringement. In judicial practice, some courts have identified the collection of commercial data that reflects the originality in the arrangement and collation of data as compilation works, and ensured the interests of the holders of original commercial data with the copyright protection mode.[26]

At present, there is no unified theory on the criteria for identifying the originality

25) Robert P. Merges, *Justifying Intellectual Property*, translated by Jin Haijun et al., Beijing: The Commercial Press, 2019, p. 68.

26) See the civil judgment (2016) Yue 0604 min Chu No. 1541 of the people's Court of Chancheng District, Foshan City, Guangdong Province; and the civil judgment (2016) Yue 06 min Zhong No. 9055 of the intermediate people's Court of Foshan City, Guangdong Province.

of commercial data sets. In Feist publications, Inc. v. Rural Telephone Service Co., the U.S. Supreme Court examined the purpose of the copyright law and interpreted the originality standard in the copyright law. The case centers on two established principles in the U.S. Copyright Law: facts are not protected by copyright law, while the compilation of facts is protected by copyright law. The Federal Supreme Court pointed out that the purpose of the copyright law is not to encourage the efforts of those who collect information, but to encourage creative expression and promote the progress of science and art. In this case, the court's criteria for identifying the originality of commercial data sets were extremely low. The court held that creativity was not required to be novel, and only creativity with "flash point" and "minimum level" was required to be protected by the copyright law.[27] Matthew Bender & Co. v. West Publishing Co. In the case, the court of Appeals for the second circuit of the United States pointed out that not all decisions on selection and arrangement are original enough to be protected by copyright law. The following two situations are considered to be compilation lacking originality: (1) selection and compilation determined by industry practices or other external factors; (2) The author has made obvious, common or conventional choices and compilation. For the originality in data selection and compilation, the court defined the following criteria: (1) the total number of available options; (2) External factors that limit the feasibility of some options and lead to the lack of creativity of other options; (3) The previous use made some choices "garden variety" options.[28]

Currently, China's copyright law does not give a detailed explanation of the original elements of commercial data sets constituting compilation works. In judicial practice, China's courts have different criteria for determining that commercial data sets meet the requirements of originality. Some courts regard "minimum" originality as the criteria for determining originality.[29] Some courts regard "a certain degree of originality" as the criteria for determining originality.[30] The value of commercial data is increasingly prominent. Too high a standard for identifying the originality of commercial data is not conducive to the protection of the interests of commercial data operators, and too low a standard for identifying the originality of commercial data will violate the legislative purpose of copyright law to encourage literary and artistic creation. Therefore, in order to better protect the interests of commercial data operators, we can refer to the practice of the United States and use the "minimum" creativity as the standard to identify the originality of commercial data sets from the perspectives of whether the selection and compilation of commercial data sets are obvious and whether the compilation mode is a certain established mode.

27) See Feist Publications, Inc. v. Rural Telephone Service Co.,499 U.S. 340 (1991).
28) See Matthew Bender & Co. v. West Publ'g Co., 158 F.3d 674 (2d Cir. 1998).
29) See the civil judgment of Beijing first intermediate people's Court (1996) Yi Zhong Zhi Chu Zi No. 54
30) Ding Hui, 「Regulatory Database Sparks Copyright Disputes」, People's Court Daily, 2004 July 13.

4.2.2. A trade secret protection model for confidential commercial data

Under Article 9(4) of China's Anti-Unfair Competition Law, trade secrets are legally defined as commercial information, including technical and operational data, that meets three fundamental criteria: it must be "not known to the public" (secrecy), possess commercial value (value), and be subject to appropriate confidentiality measures by the rights holder (confidentiality). South Korea's legal framework similarly recognizes trade secrets through a dual requirement of restricted access and objective identifiability, mandating that information must be objectively verifiable as being under confidential management through implemented protective measures. A comparative analysis of these two jurisdictions reveals a consistent tripartite standard for trade secret protection across both legal systems, comprising secrecy, value, and reasonable confidentiality measures. In the context of the digital economy, this three-element framework becomes particularly significant as corporate data collections must satisfy all these requirements to qualify for trade secret protection.

Confidentiality is one of the preconditions for commercial data to be protected by business secrets, which requires that it should not be known by the public. Here, not being known by the public needs to meet the two requirements of "not being generally known" and "not easy to obtain".[31] It should be noted that not being known to the public does not require anyone other than the obligee to know, but is a kind of relative knowledge, that is, not generally known to the relevant personnel in the relevant technology and business fields. While "not easy to obtain" requires that it is difficult to obtain certain information, which is not the information that relevant personnel can associate without creative work.[32]

Value is the key factor that distinguishes commercial data from general business information. It can bring economic benefits or competitive advantages to data holders.[33] In the era of digital economy, collecting, analyzing and operating data is one of the important sources for operators to obtain competitive advantage. Taking the Internet shopping platform as an example, the platform integrates and analyzes data by collecting user browsing records, purchase records, return records, and other commercial data information. This is done to optimize the platform's operation mode, improve the quality of the platform's products, push products that

31) Article 9 of the interpretation of the Supreme People's Court on Several Issues concerning the application of law in the trial of civil cases of unfair competition: the relevant information is not generally known and easily available to the relevant personnel in the field to which it belongs, and should be recognized as "not known to the public" as stipulated in paragraph 3 of Article 10 of the Anti-Unfair Competition Law.

32) Jiang Zhiping et al., "Understanding and Application of the Explanations on Several Issues Concerning the Application of Law in the Trial of Civil Cases of Unfair Competition", *Legal Application*, No.3(2007), pp. 21-28.

33) Article 10 of the interpretation of the Supreme People's Court on Several Issues concerning the application of law in the trial of civil cases of unfair competition stipulates that if the relevant information has real or potential commercial value and can bring a competitive advantage to the obligee, it shall be recognized as "it can bring economic benefits to the obligee and has practicability" as stipulated in paragraph 3 of Article 10 of the anti unfair competition law.

meet user preferences, and expand the product sales market. To improve the platform's revenue, the value of commercial data is self-evident. The proof of value can be determined by objective and quantitative standards such as time, money and energy paid by the data holder for the research and development of information.[34]

The confidentiality of trade secret data requires enterprises to take confidentiality measures for core data information to prevent data leakage. In the network environment, data information is more risky than traditional business information. In the mechanical age, data information is often stored in physical media. Information holders only need to take confidentiality measures at the physical level to meet the confidentiality requirements. Because data information is stored in the cloud, the possibility of data leakage is greatly increased. Data information holders need to take corresponding technical measures to meet the confidentiality requirements. Given that cloud service technology is not yet mature at this stage, it is inevitable that there will be loopholes in the management and operation process. Thus, the confidentiality requirement for trade secret data does not demand absolute secrecy; rather, it is sufficient if disclosure is restricted to those under a confidentiality obligation and such restricted status is maintained, thereby satisfying the non-publicity condition.[35] For business data operators, implementing reasonable technical measures—such as encryption and access restrictions—is adequate to fulfill the "confidentiality" requirement under trade secret law.

4.2.3. A new intellectual property protection model for general commercial data

Other commercial data that are not original in selection and arrangement and cannot constitute a compilation of works protected by copyright law, and that do not meet the three-characteristics requirements of trade secrets and cannot constitute a trade secret protected by the trade secret rules are collectively referred to as general business data. Such data has the characteristics of aggregation, substantial investment and commercial value. General commercial data processors have invested a lot of manpower and material resources in the process of collection, filtering, integration and development. Their interests can be protected by building new intellectual property rights under the framework of existing intellectual property rights, namely "general commercial data processor rights".

The expansion of intellectual property protection scope represents a gradual yet overarching trend. Against this backdrop, the protection of general commercial data through the IP regime is theoretically feasible. The labor theory of property posits that labor serves as the key medium for transforming communal resources into private property. In the state of nature, individuals may acquire ownership over natural resources through their labor.[36] Locke's labor-based justification for

34) Lu Chunxin, "The Revision of the Trade Secret Provisions in the Anti-Unfair Competition Law", *Legal Forum*, No.3(2017), pp. 218-228.

35) Yang, Insu & Park, Sunha, "A Study on Requirement of Non-Publicity for Trade Secrets", *Journal of Intellectual Property*, Vol.20 No.1(2025), p. 1.

entitlement not only provides a theoretical foundation for the legitimacy of private property but also inspires later intellectual property theories. Labor is not confined to physical exertion; it equally encompasses mental and creative activities.[37] From the perspective of commercial data generation, such data is produced through enterprises' collection of massive raw data, followed by desensitization, processing, information mining, and analytical refinement before attaining economic value. The entire workflow—from data collection and filtration to value extraction—reflects substantial intellectual investment and labor-time expenditure.[38] Therefore, under Locke's labor theory of property, granting proprietary rights to producers of general commercial data and protecting their interests through the intellectual property system is justified.

Constructing a new rights system under the framework of intellectual property rights is a feasible approach to protect general commercial data, and relevant regulations in foreign jurisdictions offer valuable references. In particular, the European Union has proposed the Database Protection Directive, which safeguards databases from two perspectives: copyright protection for databases and special rights protection for databases.[39] The sui generis protection, a unique institutional arrangement for data lacking originality but possessing commercial value, is notable. In terms of the legal effect of special rights protection, database producers may prohibit others from "extracting" and/or "reusing" all or a substantial part of their database content, whether in terms of quantity or quality. "Extraction" is defined as the act of permanently or temporarily transferring the entire content of the database or a substantial part thereof, in terms of quantity or quality, to another medium by any means or in any form. "Reuse" refers to the act of making the entire content of the database or a substantial part thereof, in terms of quantity or quality, available to the public through distribution, rental, online transmission, or other means of dissemination. Drawing on the EU model, it is advisable to construct a new category of "general commercial data intellectual property" beyond traditional intellectual property rights (e.g., copyright, patents, and trademarks). Such an approach would better accommodate the evolving needs of commercial data governance in the era of big data.

4.3. Intellectual property solutions for data protection reform in South Korea

The ongoing industrial transformation and digital advancement have brought the proprietary value of data flows into sharp focus, prompting a discernible shift in

36) John Locke, *Two Treatises of Government*, translated by Ye Qifang and Qu Junong, Beijing: The Commercial Press, 1964, p. 77.

37) You Dan, *Research on Open Innovation and the Intellectual Property System*, Beijing: Intellectual Property Press, 2017, pp. 143.

38) Feng Xiaoqing, "Research on the Protection of Commercial Data from the Perspective of Intellectual Property Rights," *Comparative Law Studies*, No.5(2022), pp. 31-45.

39) Shiwon Ryu, "Reassessing Database Right Provisions in Copyright Act - Review of Supreme Court Decision 2021Do1322," *Journal of Intellectual Property*, Vol.18 No.1(2023), p. 183.

legal protections toward safeguarding data's economic attributes. In October 2021, South Korea's Ministry of Science and ICT (MSIT) announced the Cabinet Council's adoption of the Framework Act on the Promotion of Data Industry and Data Utilization (hereafter Data Framework Act), which entered full force in April 2022. As the world's first foundational legislation governing data industries, this statute establishes a comprehensive regulatory architecture for data production, transactions, and utilization. The Act serves dual purposes: (i) creating legal mechanisms to extract economic value from data assets, and (ii) ultimately enhancing national living standards and economic development through systematic data governance.[40]

Article 12 of the Data Framework Act mandates protection for data assets—defined as economically valuable datasets produced through substantial human and capital investments—against unauthorized acquisition, use, or disclosure. Notably, enforcement occurs through referral to the Unfair Competition Prevention and Trade Secret Protection Act, reflecting South Korea's deliberate adoption of a "behavioral paradigm" (regulating improper conduct) rather than an "entitlement model" (creating absolute property rights). While this approach reduces institutional costs and provides baseline protection for data holders, its limitations become apparent when addressing the needs of sustainable digital economic development. Behavioral regulations alone cannot ensure the robust data supply chain required for advanced digital markets, as they fail to establish clear ex ante rights boundaries that facilitate transactions and investments. Property rights, as essential social institutions, provide the necessary ex ante predictability for market participants to internalize costs, allocate losses, and rectify misconduct—functions critically absent in pure behavioral frameworks.

It should be noted that while South Korea's Copyright Act provides protection for databases, significant limitations exist in practice regarding the fulfillment of statutory protection requirements.[41] On one hand, databases demonstrating originality in their selection and arrangement may qualify as compilations eligible for copyright protection, rendering unnecessary the establishment of a separate database right to safeguard producers' interests. On the other hand, other types of databases—despite possessing commercial value—often fail to meet the originality threshold for copyright protection, as mere collections of information or data typically lack sufficient creative expression to constitute protectable works. Moreover, adopting an extreme "sweat of the brow" doctrine would risk extending protection to works that contribute little to cultural progress, thereby contravening the fundamental objectives of copyright law.[42] Consequently, it is inappropriate to

40) Lee Jungnyum, "The Legislative Meaning and Limitations of the 'Act on the Promotion of the Data Industry and the Activation of Data Use' - Focusing on Prohibited Actions and Sanction Provisions", *IT & Law Review*, Vol., No.24(2022), p. 269.

41) Kim Si Yeol, "Study on the Re-discussion of Japan's Provisions for the Protection of Shared Data with Limited Access and the Revision of Korea's Unfair Competition Prevention and Trade Secret Protection Act," *Journal of Intellectual Property*, Vol.18 No.1(2023), p. 113.

42) Goo Dae Hwan, "Copyright Protection of Databases in the EU and Korea", *The Law Research*

rely on copyright law for database protection.

To enhance its existing legal framework for commercial data protection, South Korea should first establish a clear statutory definition of commercial data. The 2022 draft amendment to China's Anti-Unfair Competition Law (Revised Draft for Comment) defines commercial data as "data collected lawfully by business operators that possesses commercial value and has been subject to corresponding technical management measures" - a definition that South Korea could productively reference. Building upon such conceptual clarity, the Korean legal system could then implement differentiated protection mechanisms based on the distinctive attributes of various commercial data types through intellectual property instruments. Specifically, databases demonstrating creative selection, arrangement or combination of contents may qualify for protection as compilation works under the Copyright Act; commercially valuable data subject to reasonable confidentiality measures could be safeguarded through the Unfair Competition Prevention and Trade Secret Protection Act; while general commercial data that has undergone substantial processing, maintains commercial value, but lacks both confidentiality measures and creative organization might be protected through a newly constructed data intellectual property right within the existing intellectual property framework.

5. Conclusion

The rapid development of the digital economy has positioned commercial data as a critical production factor, whose full value realization is essential for advancing high-quality digital economic growth and cultivating new quality productive forces. Refining existing commercial data protection mechanisms can further invigorate data elements, providing robust institutional support for developing these innovative productive capacities. While the South Korean government has demonstrated strong commitment to data protection at the macro level through policy initiatives, its micro-level regulatory framework still lacks systematic rules specifically addressing commercial data protection. The intellectual property approach to commercial data protection enjoys strong normative justification, supported by substantial theoretical foundations and evidenced through China's judicial practice where courts have successfully applied intellectual property laws to resolve commercial data disputes. This practical experience provides valuable insights for developing specialized intellectual property protection pathways.

Within the intellectual property framework, differentiated protection strategies can be implemented according to the distinctive attributes of various commercial data types: compiled datasets may qualify for protection as compilation works under copyright law; processed commercial data meeting secrecy requirements can secure trade secret protection; while other forms of value-added processed data may be

Institute Seoul National University, Vol.47 No.1(2006), p. 261.

eligible for a newly constructed sui generis intellectual property right. By implementing this sophisticated intellectual property approach, policymakers can create an optimal balance between protection and utilization – one that harnesses commercial data's full potential to drive innovation and power the new quality productive forces essential for future economic growth.

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