Exploring the Path of Data Intellectual Property Protection in the Context of the Digital Economy

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Abstract: The digital economy's rapid growth has ushered society into a new era, where data holds immense significance. In the field of legal academia, data can be seen as an important carrier of intellectual property rights in a legal sense. Therefore, the research on the path and models of intellectual property protection for data in the context of the digital economy has become a focus of domestic and foreign scholars. This paper aims to address the issues of limited avenues and low effectiveness in the protection of data intellectual property rights in China. Through the definition and comparison of the concepts of data and intellectual property rights in academic terms, this paper analyzes and compares the data protection models in various countries worldwide with the actual data protection situation in China, and summarizes the findings. Furthermore, the paper proposes specific measures for the protection of data intellectual property rights in China, such as establishing clear standards for certifying data compilation works and enacting specialized legislation for data protection. These proposed regulations help to alleviate the current challenges in data intellectual property rights protection to a certain extent.

Keywords: intellectual property, data resources, data property rights, digital economy, regulatory pathway

1. Introduction

The development of the digital economy is an important aspect of our country's strategic goals in transitioning from a major industrial nation to an industrial powerhouse and building a modern industrial system. It holds significant importance for China's realization of socialist modernization.

In the existing research on the regulatory pathways for data intellectual property rights protection, many scholars have preliminarily proposed regulatory approaches. Feng suggested drawing upon the principles and norms of the existing intellectual property rights system to establish a comprehensive legislative system aimed at improving the normative structure for the protection and limitation of data property rights [1]. Dong argued for the establishment of a new set of values and a more rational architecture for intellectual property rights data governance in order to address the challenges in data governance [2]. Xu proposed the exploration of a new mechanism of private law specifically tailored for enterprise data protection, thereby seeking a pathway for protecting data property rights [3].

Through a review and analysis of existing literature, it can be observed that these scholars' viewpoints are built upon macro-level theories. Although these viewpoints reflect their comprehensive considerations and solutions for data intellectual property rights protection, they lack in-depth exploration of how to implement these ideas in practical operations. The absence of specific implementation details may hinder the translation of these viewpoints into viable policies and legal measures, thus restricting further development and practical application in the field of data intellectual property rights protection [4]. Therefore, further research and specific operational guidelines are necessary to ensure the feasibility and effectiveness of these viewpoints. In the future, through case studies, empirical research and evaluation, interdisciplinary cooperation and international cooperation, more practical policy recommendations may be obtained [5], and the gaps can be bridged, thus promoting the development of data intellectual property protection.

This paper uses literature research and case analysis to summarize the studies on data intellectual property at home and abroad and obtains some effective experience from foreign data intellectual property cases. This work can provide regulatory guidance for the protection of data intellectual property rights in China.

2.   Analysis of Current Data Protection Models in China

2.1.   Protection Model under *the Civil Code*

The legal protection of data in China can be traced back to Article 127 of *the General Provisions of the Civil Code* in 2017, which states, "If the law has provisions for the protection of data and virtual network property, those provisions shall be followed." This provision clearly indicates that data is protected by law. The revised *Civil Code* in 2021 also includes similar provisions. While these provisions recognize that data can be considered virtual property and protected by law, they do not further establish "data property rights" or provide legal effectiveness against unspecified third parties, which do not sufficiently enhance the effectiveness of data protection.

2.2.   Protection Model under *the Anti-Unfair Competition Law*

Currently, the protection of data under *the Anti-Unfair Competition Law* in China mainly involves two approaches: general provisions and the protection of trade secrets. General clauses protection is usually based on the application of anti-unfair competition laws [6]. By analyzing practical cases of general clauses in the protection of data-related rights in the past, it becomes evident that this method of protection carries a high degree of uncertainty and casuistry, undermining judicial stability. Often, it is considered a suboptimal choice from a legislative standpoint. The protection of trade secrets includes the incorporation of commercial data into the category of trade secrets for protection. Article 9 of *the Anti-Unfair Competition Law* defines trade secrets, stating that trade secrets are commercial information that is not publicly known, has commercial value and the right holder has taken corresponding confidentiality measures. There are different opinions regarding the scope of the public. Most opinions argue that trade secrets not being publicly known does not mean that the general public or individuals outside the right holder cannot understand it but rather that it is generally known among relevant professionals in the field [7]. *The Shanghai Data Regulation* has defined the scope of public data, indicating that data owned by state organs, public institutions, and organizations that fulfill public affairs management functions and provide public services belong to the public scope. However, some argue that data in certain public service areas involves a large amount of personal privacy and industry secrets and should not be included in the public scope. Therefore, incorporating commercial data into trade secrets has operational difficulties in judicial practice.

In conclusion, the current *Anti-Unfair Competition Law* regulates infringers and victims with a direct competitive relationship. It is challenging to regulate the utilization of data by different business entities under this law due to the massive amount of information contained in the digital economy.

At the end of 2021, the State Administration for Market Regulation drafted the "*People's Republic of China Anti-Unfair Competition Law (Draft for Solicitation of Comments)*," which includes Article 18 that regulates four types of unfair practices related to data acquisition and use, protecting the legitimate rights and interests of operators' business data. However, this regulatory model is too passive and inconsistent with the overall trend of encouraging rights holders to actively exercise their disposal rights over data property. It is limited to post-remedies in the field of market competition and has a high degree of uncertainty.

2.3. Protection Mode under *the Data Security Law*

In September 2021, the implementation of *the People's Republic of China's "Data Security Law"* (referred to as the *"Data Security Law"* hereafter) marked the establishment of dedicated legal protection for data security in our country. Article 7 of this law states, "The state protects the rights and interests of individuals, organizations, and data-related matters, encourages the lawful and reasonable utilization of data, safeguards the lawful and orderly free flow of data, and promotes the development of the digital economy with data as a key element." This reflects the recognition of data rights [8]. However, when examining *the Data Security Law* as a whole, it mainly consists of principle-based provisions regarding the protection of data security and the regulation of data activities. In specific judicial practice, it only plays a guiding role at a macro level.

3. Exploring the Regulatory Path of Data Intellectual Property Rights

In this section, the relevant terminology of the nature of data's information rights, the protection methods, and the protection scope are clarified. Moreover, an evaluation of the current domestic path of data intellectual property rights protection is conducted.

3.1. Relationship between Data and Information

Data serves as a medium for information. In comparison to information, data is rawer and essentially refers to unprocessed numerical codes that have not been structured according to specific paradigms. In the era of the digital economy, data exhibits characteristics such as abundance, rapidity, diversity, low value density, and authenticity. However, not all data can be considered as a source guiding economic activities. Information, on the other hand, is the result of processing and filtering data, allowing it to be handled in a structured manner. In *the Information Technology Vocabulary*, "data" is defined as the "re-interpretable formal representation of information applicable to communication, interpretation, or processing." In other words, data is defined as a special form of representing knowledge, which is interdependent with the information constituting the knowledge ontology. Numerous interrelated data are organized into databases based on certain classification criteria, and the so-called "big data" is formed on the basis of databases. The value of data mainly lies in its commercial and social aspects. From a commercial perspective, with the rapid popularization and iteration of Internet technology, online transactions have become increasingly frequent [9]. The ability to collect and categorize data has been enhanced, generating personalized data in various fields such as e-commerce platforms, video and audio websites, and social media. These data can precisely depict individual profiles and serve as an important decision-making basis for businesses. From a social value perspective, databases and the digital economy greatly facilitate people's lives, and data plays a significant role in society.

3.2. Relationship between Data and Intellectual Property Rights

Data itself possesses economic and social value, which can effectively enhance the core competitiveness of countries and enterprises. Big data analysis often involves the collection and integration of data through investments in manpower, material resources, and financial resources. By identifying overlapping relationships within the data, positive value can be created. Therefore, how to grasp and protect data and possess the right to use data has become an important topic. Intellectual property rights, granted to creators for their intellectual achievements, have proven superior in China's judicial practice. Data should be protected under these rights [10]. To incorporate data into the intellectual property protection system, it is necessary to demonstrate the similarity between data and the objects of intellectual property rights. Hence, this paper focuses on comparing the rights objects of intellectual property rights with data, and exploring the main legal characteristics of intellectual property rights objects.

3.3. Analysis of Existing Intellectual Property Protection Models

The Copyright Law of the People's Republic of China (hereinafter referred to as the *"Copyright Law"*) primarily adopts the protection model of compilations for the protection of data assets. This means that data is compiled and formed into works, which are then protected under the copyright protection system. It fully reflects the spirit and concept of valuing intellectual property rights and encouraging innovation. However, it can also be observed that the existing data protection model cannot provide comprehensive protection for various types of data and has certain limitations.

Firstly, during the compilation process, the selection of data may exclude databases with originality and enormous commercial value, which can undermine the creative motivation of creators. Secondly, according to the relevant provisions of China's Copyright Law, all works must be original. By enacting *the Copyright Law*, China grants authors the right to their original expressions. In other words, compilation works, including electronic compilations, are not explained based on the labor theory but on the theory of intellectual creation, with databases being the most representative in electronic compilations. According to *the Copyright Law*, a work requires originality, and therefore, a compilation work also requires originality. If the methods or arrangements used by the compiler are choices and methods that anyone can make, and if almost the same results appear in the same degree of data use and corresponding methods or arrangements, it is difficult to determine it as a compilation work with originality.

To sum up, although the current domestic copyright protection model provides some protection for the legitimate rights and interests of data owners, it still has certain limitations. First, the collection activities of general data often have strong independent capturing characteristics, which conflict with the high degree of originality required for traditional compilation works and are generally difficult to achieve. Second, from the perspective of copyright regulation, the protection of data in judicial practice is extremely challenging [11]. The focus of data copyright protection lies in the architectural structure of data compilation works rather than their content. Under such a legal system, data infringers only need to recompile and adapt the original data to easily evade infringement liability, which poses significant limitations.

4. Analysis of Foreign Data Protection Regulations

4.1. The United States Model

In the United States, data protection regulations differ from the comprehensive privacy laws found in the European Union (EU). Instead, the data protection model in the United States exhibits a significant characteristic whereby specific industries or data types are governed by different laws

and regulations. The following section highlights four data protection models targeting distinct groups or domains.

Health Insurance Portability and Accountability Act (HIPAA) provides privacy and security protections for individuals' health information and sets standards for the use and disclosure of protected health information by covered entities, such as healthcare providers, health plans, and healthcare clearinghouses.

Gramm-Leach-Bliley Act (GLBA) regulates the financial industry and requires financial institutions to protect the privacy and security of customers' personal financial information. It establishes requirements for notice, disclosure, and opt-out mechanisms.

Children's Online Privacy Protection Act (COPPA) aims to protect the privacy of children under 13 years of age. It imposes requirements on operators of websites and online services directed toward children, including obtaining parental consent for collecting personal information.

Although not federal laws, *the California Consumer Privacy Act* (CCPA) and California Privacy Rights Act (CPRA) have a significant impact on data protection in the United States, particularly within the state of California. These state-level regulations grant California residents the rights to control the collection, sale, and disclosure of their personal information by businesses operating in California.

4.2. European Union Model

In the European Union, there are two pieces of legislation in the field of data protection: *the General Data Protection Regulation* (GDPR) and *the Data Protection Law Enforcement Directive*. The main content of GDPR includes managing personal data, protecting natural person data, and the natural flow of such data, while *the Data Protection Law Enforcement Directive* is aimed at personal data processing related to criminal offenses. Therefore, for commercial companies, it is only necessary to comply with the requirements of GDPR. The implementation of *GDPR* is undertaken by all European Union member states, and *the European Data Protection Board* (EDPB) has been established in Europe to supervise the application of data protection principles throughout the European region. The EDPB's work is to explain some of the important views of GDPR, provide opinions on legislative proposals related to personal data protection in Europe to the European Commission, and make rulings on disputes that arise within national regulatory authorities.

4.3. German Model

German law takes measures to protect neighboring rights for non-original database systems. Article 6 of Part 2 of the Copyright Act and Related Rights Act of *the Federal Republic of Germany* explicitly provides for the "protective rights of database creators". In this provision, database system creators have exclusive rights, including copying, publishing, disclosing, and reusing their complete actual parts, or copying, publishing, and disclosing qualitative or quantitative parts without actual parts [12]. Database system creators refer to the subject who has substantive participation in the collection, collation, display, and other forms and scope of the database content.

4.4. Japanese Model

According to *the Copyright Act*, Japan defines the concept of a database system as a unified arrangement of data content, including text, data, and graphics, which enables the computer system to access such data. Database systems established through a certain system will be saved as works. The Japanese government also maintains databases as its copyright. In Japan, maintenance of

copyrighted works does not require special technical creativity, and these databases are also considered protected.

4.5. Insights from Overseas Data Protection Models

According to the contents in sections 4.1 to 4.4, it can be observed that countries have made significant efforts in defining and establishing relevant systems to ensure the effective protection of data's intellectual property rights. China can learn from the successful experiences of other countries to improve data intellectual property protection mechanisms in the digital economy. Firstly, it is important to clearly define the attributes of data and implement different protection models for data belonging to private and public domains. Secondly, guidelines should be developed for the construction of paradigmatic databases, and the utilization of databases should be categorized and monitored accordingly [13].

5. Suggestions for Improving the Path of Data Intellectual Property Protection in China

5.1. Clarifying the Criteria for Recognizing Compilation Works

Under the current intellectual property protection model in China, the main model of data protection is copyright protection, specifically the protection of compilation works. The limitations of this model have been discussed in Section 3. The fundamental reason for these limitations is the absence of a unified recognition criterion for data compilation works. The establishment of such criteria should be based on encouraging innovation. As long as the data owner can prove that the entire process of collecting, analyzing, and compiling the data is independently conducted and reflects their subjective judgment and evaluation [14], the originality of the data compilation work can be recognized and protected under relevant provisions.

5.2. Enacting Special Legislation for Data Rights Protection

To fully incorporate data protection into China's intellectual property system, it is necessary to enact specialized legislation for the protection of data rights. In Section 3, the intrinsic connection between data and intellectual property objects is discussed. Therefore, there are primarily two forms of legislation [15]. Firstly, expanding interpretation or creating a new category of intellectual property protection objects to include data in existing protection models. Secondly, drawing on the norms of the intellectual property system and enacting specialized legislation for the protection of commercial data by borrowing principles from the intellectual property system to construct a specialized and targeted data property rights protection system [16], which helps to define the legal attributes and ownership of data more reasonably, and better protects the legitimate rights and interests of data owners.

6. Conclusion

Data is the direct carrier of social progress and an important pillar for driving technological development. In this paper, relevant concepts are analyzed, and domestic and international models for data intellectual property protection are examined. The study reveals that China's data intellectual property protection should build upon the existing protection models and draw from the experiences of other countries. This includes establishing different protection models for natural persons and commercial purposes, as well as finely dividing the compilation and utilization of databases. These efforts contribute to the establishment of a broader and stronger model for intellectual property protection.

This paper explored the pathway for data intellectual property rights protection in the context of the digital economy. However, certain limitations need further improvement. Firstly, the focus of this study is mainly on the legal and regulatory aspects, with limited exploration of the impact on technology and innovation. Secondly, while the regulatory methods and suggestions have been proposed, the specific details regarding the implementation and operational aspects have not been extensively elaborated. In the future, it might make more sense to delve into the interaction between data intellectual property rights protection and technological innovation. Additionally, It is necessary to make more specific and feasible implementation strategies to effectively address the challenges of the digital economy era.

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