

# The Improvement Pathway of the Data Intellectual Property Pledge Financing System

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**Abstract:** Protection and application are the two most critical "driving wheels" in the intellectual property chain, and pledge financing serves as a vital pathway for intellectual property application. Data intellectual property pledge financing offers a novel financing avenue for data enterprises. However, numerous challenges persist in China's data intellectual property pledge financing, hindering its large-scale adoption in financing for data enterprises. Conducting in-depth research on data intellectual property pledge financing-where practical problems abound but studies are scarce-is an important issue that both academia and practitioners must address. Improving the data intellectual property pledge financing system should focus on preventing risks associated with the collateral, refining the establishment mechanism, and optimizing the realization of the security rights.

**Keywords:** Security Rights, Data Intellectual Property, Pledge Financing.

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## 1. Introduction

Protection and application are the two most critical "driving wheels" in the intellectual property chain. Intellectual property pledge financing serves as a vital pathway for the application of intellectual property and represents a significant measure to realize China's national intellectual property strategy of "stimulating innovation, promoting effective application, ensuring legal protection, and implementing scientific management." The "Outline of the 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives Through the Year 2035" emphasizes improving the financial system to support innovation and encouraging financial institutions to develop sci-tech financial products such as intellectual property pledge financing. The "Outline for Building a Powerful Intellectual Property Nation (2021-2035)" calls for the establishment of a market operation mechanism for intellectual property that incentivizes innovation, standardizes and explores innovations in intellectual property financing models, and constructs a timely and reasonably protective intellectual property rule system for emerging and specific fields, including research on data intellectual property protection rules. The "14th Five-Year Plan for National Intellectual Property Protection and Utilization" also provides clear directives. In practice, some enterprises have already utilized data intellectual property for pledge financing. In 2021, the first data intellectual property pledge in China was implemented in Hangzhou, followed by 14 data enterprises in Zhejiang Province securing financing of 97 million yuan through data intellectual property pledges. These local practices in the application and protection of data intellectual property have begun to yield results. Data intellectual property pledge financing offers a novel financing avenue for data enterprises. However, due to its late development in China, the relevant laws and supporting measures are incomplete, theoretical research remains weak, and there is a lack of systematic and forward-looking planning. As a result, it is challenging to establish a mature market mechanism for data intellectual property pledge financing. The risks involved in the financing process are significant, and financial institutions such as banks lack

enthusiasm, making it difficult to promote this financing method on a large scale among data enterprises. Conducting in-depth research on the issues surrounding data intellectual property pledge financing-where practical problems abound but research is scarce-and providing theoretically sound, practical, and contextually appropriate countermeasures and suggestions are of great significance.

## 2. Risk Prevention of Collateral in Data Intellectual Property Pledge Financing

Research on risk prevention in data intellectual property pledge financing is crucial for the implementation of top-level designs and the construction of China's modern economic system. To fully unleash the value of data intellectual property, accelerate the building of a powerful intellectual property nation, and address the financing challenges faced by small and medium-sized tech enterprises, specific risk prevention measures must be proposed to mitigate the legal risks associated with the collateral in the data intellectual property pledge financing process.

### 2.1. Clarifying the Ownership of Data Intellectual Property to Reduce Legal Risks Related to Ownership

The current rapid development of data assetization makes the exploration and application of data intellectual property particularly necessary. Data rights confirmation is an important prerequisite for unleashing the potential value of data and building a data factor market. [1]For data intellectual property pledge financing, clarifying the ownership of data intellectual property can effectively reduce legal risks related to ownership and facilitate the smooth implementation of data intellectual property pledge financing in practice.

First, establish a mechanism for confirming data intellectual property rights. Data intellectual property refers to the exclusive rights enjoyed by the rights holder over datasets derived from substantive processing or creative labor on legally acquired data, which possess practical value and attributes of intellectual achievements. Regarding the protection model for datasets, there has been a debate within

the intellectual property system between the rights-based model (empowerment model) and the liability-based model (behavioral model). However, there is currently no consensus in both theoretical and practical circles on what kind of data or under what conditions data can be protected by intellectual property rights, or which interests in data are worthy of protection. In current practice, regulations often rely on the Anti-Unfair Competition Law, which is frequently regarded as a fallback protection for intellectual property rights. Protecting data rights and interests through a behavioral model within the intellectual property system is already a feasible path. However, exploring data intellectual property protection aims to break through existing models and seek the possibility of an empowerment model for data under the intellectual property system. From the perspective of the long-term development of the digital economy, the data intellectual property protection model is more appropriate and suitable. [2]

Second, strengthen preliminary reviews to ensure clear ownership. To reduce the legal risks associated with the collateral in data intellectual property pledge financing, in addition to clarifying the ownership of data intellectual property and establishing a nationally unified data intellectual property registration system, it is also necessary to enhance the preliminary review of data intellectual property pledge financing. This involves setting certain thresholds for pledge financing, allowing only data intellectual property that meets specific conditions to enter the pledge financing process.

Furthermore, strengthen the protection of data intellectual property ownership. To reduce the risks related to collateral ownership, it is essential to enhance the protection of data intellectual property ownership and establish a nationally unified data intellectual property management system. This will help coordinate differences in policies and regulations across regions, reduce the legal risks and costs faced by enterprises during the data intellectual property pledge financing process, incentivize innovation and creation, and thereby promote the sharing and utilization of data resources, as well as the development of data intellectual property pledge financing.

## **2.2. Multiple Measures to Reduce Legal Risks Arising from Fluctuations in the Value of Data Intellectual Property**

In data intellectual property pledge financing activities, the value of data intellectual property is highly volatile due to various factors such as market conditions and technological developments. Fluctuations in the value of the collateral can easily lead to legal risks. To effectively mitigate the adverse consequences caused by such value fluctuations, multiple measures and collaborative efforts are required.

First, utilize pooled collateral to counter legal risks from normal value fluctuations. Encouraging the exploration of pooled collateral is an important aspect of modernizing the security system. For data intellectual property, it is quite common for its value to be unstable and susceptible to depreciation due to external factors. To address the legal risks arising from normal depreciation in the value of data intellectual property pledge financing collateral, the method of pooled collateral can be employed. This involves combining intangible rights like data intellectual property with other tangible assets into a single collateral package. In this way, the relative stability of tangible asset values can help offset the risks, effectively reducing legal risks such as the

inability to realize security interests due to normal depreciation of data intellectual property. This, in turn, can alleviate the concerns of financial institutions like banks, enhance their acceptance and enthusiasm for data intellectual property pledge financing, and promote its better implementation in practice.

Second, foster multi-stakeholder collaboration to address legal risks from abnormal value fluctuations. The risks of data intellectual property pledge financing can be assumed by policy-based guarantees, commercial guarantees, or a combination of both. Policy-based guarantees can help technology-based small and medium-sized enterprises share part of the risks, effectively address information asymmetry, and facilitate successful pledge financing for these enterprises. [3] In practice, policy-based guarantees have long been introduced in intellectual property pledge financing. Cities such as Beijing, Pudong, Wuhan, and Xiangtan have developed their own distinctive risk control mechanisms, with the Shanghai Pudong model being a typical example of policy-based guarantees. However, policy-based guarantees have their functional and role limitations. With the development of the market economy, an increasing amount of social capital has flowed into the market, and market entities have spontaneously established guarantee institutions based on market demand, giving rise to commercial guarantees. While policy-based guarantees may gradually weaken, they will not disappear entirely due to factors such as national policies supporting small and medium-sized enterprises. Instead, they will gradually become a beneficial supplement to commercial guarantees. To address legal risks arising from abnormal value fluctuations, multiple stakeholders, including the government, enterprises, and guarantee institutions, need to collaborate and coordinate. Efforts should focus on improving mixed guarantee mechanisms, strengthening internal corporate management, and implementing multiple measures to jointly mitigate the adverse consequences of collateral depreciation.

## **2.3. Strengthening the Protection of Data Intellectual Property to Prevent Legal Risks from Infringement**

In the field of data intellectual property pledge financing, it is essential to enhance the protection of data intellectual property to effectively address the legal risks of collateral infringement and fully unleash the role of data as a factor.

First, improve the punitive compensation system for infringements. By continuously refining the punitive compensation system for infringements and introducing punitive damages in the field of data intellectual property pledge financing, the illegal costs for infringers can be increased. This aims to curb the occurrence of collateral infringements, assist technology-based small and medium-sized enterprises in successfully obtaining funds through data intellectual property pledges, and inject vitality into the development of the digital economy. [4]

Second, establish a diversified dispute resolution mechanism for data intellectual property infringement. This requires, firstly, the establishment of a procuratorial public interest litigation system for data intellectual property infringement. Building such a system will help strengthen the protection of data intellectual property, promote the smooth implementation of data intellectual property pledge financing for enterprises, and balance the interests among various entities, as well as the relationship between the dissemination,

utilization, innovation, and creation of data intellectual property. In this era of the knowledge economy, the protection of intellectual property is crucial for building China into a powerful intellectual property nation, as well as for the development of the economy and the enhancement of comprehensive national strength. The protection of intellectual property has already risen to an important strategic level for national development. In practice, infringements of intellectual property rights are constantly emerging, and greater emphasis should be placed on the protection of data intellectual property. Therefore, it is necessary to explore the establishment of a procuratorial public interest litigation system for data intellectual property infringement. Secondly, promote non-litigation methods to resolve data intellectual property infringement disputes. The "Outline for Building a Powerful Intellectual Property Nation (2021-2035)" proposes the establishment and improvement of an intellectual property arbitration, mediation, notarization, appraisal, and rights protection management system. For potential disputes and related issues in data intellectual property pledge financing, a diversified dispute resolution mechanism can be explored to provide comprehensive institutional support and safeguards for all aspects of the circulation and transaction processes of data as a factor.

Third, establish a new regulatory system with multi-party participation and collaborative governance. In recent years, the digital economy has rapidly emerged, with new business forms and models continuously appearing, becoming a key area of competition for countries worldwide. The high-quality development of the digital economy requires the construction of a favorable intellectual property ecosystem. Currently, data intellectual property infringements cover a wide range of fields, are highly concealed, and involve increasingly diverse and technical methods, with frequent occurrences of infringements. Risk prevention and supervision management complement each other. To effectively prevent the legal risks arising from collateral infringement in data intellectual property pledge financing, multiple entities need to work together to establish a new regulatory system with multi-party participation and collaborative governance. Firstly, it is essential to accelerate the creation of specialized management agencies for data intellectual property to conduct comprehensive supervision and management of data intellectual property pledge financing. Management agencies must fully perform their supervisory and management functions, severely crack down on behaviors that infringe data intellectual property rights, and resolutely impose penalties. They should also strengthen supervision over various market entities, enhance their sense of responsibility, and urge enterprises to actively engage in activities such as data intellectual property rights confirmation registration and information disclosure, ensuring the security and efficiency of the data intellectual property circulation market. Secondly, multi-party participation should form a regulatory synergy. In data intellectual property pledge financing, the prevention of legal risks from collateral infringement involves multiple entities, including enterprises, the government, and financial institutions. From the perspectives of different entities, cooperation between different departments should be strengthened, information-sharing mechanisms should be established and improved, and regulatory synergy should be formed to build a new regulatory system with multi-party participation and collaborative governance. Additionally, to better prevent the legal risks of collateral infringement in data

intellectual property pledge financing and strengthen the supervision of data intellectual property, the construction of a social credit system for the data intellectual property market can be explored.

### **3. Improvement of the Establishment of Data Intellectual Property Pledge Financing**

With the introduction of various policy documents in recent years, the industry's demand for a clear establishment procedure for data intellectual property pledges has become increasingly urgent. It is foreseeable that, guided by national policies and extended industry development, establishing a set of compatible and balanced procedures for creating data intellectual property pledges is an inevitable trend.

#### **3.1. Adoption of the Registration-Counteraction Principle for Establishment**

The characteristic of data intellectual property itself having significant value fluctuations determines that its pledge creation is best suited to a dualistic "agreement + delivery" model. The agreement element is manifested in the pledge contract, and the delivery element is manifested in the transfer of possession of the data intellectual property rights certificate. The pledge right can only become effective against third parties after pledge registration, thereby achieving the complete establishment of the data intellectual property pledge in a broad sense.

First, creating the pledge through delivery of the rights certificate. Data intellectual property has a physical form of rights certificate. The pledgee can procedurally prove their pledge right over the pledged rights by possessing the rights certificate. From a normative perspective, under China's legislative model, there are numerous instances in the field of rights pledges where the registration-counteraction principle is applied for pledge creation, with constructive delivery being the statutory delivery method. For example, the delivery for bills of exchange or warehouse receipt pledges involves delivering the rights certificate to the pledgee, substituting for the actual, physical delivery of the rights. From a scientific perspective, the characteristic of data intellectual property itself having significant value fluctuations makes it more suitable for a pledge creation method where the pledge right is established upon delivery.

Second, the pledge right acquires counteraction effect upon registration. Compared with the registration-effectiveness principle, a pledge right created under the registration-counteraction principle lacks a means of public notification. Neither the pledge contract concluded between the parties nor the change in the real right status formed through constructive delivery can be easily observed or known by external parties. Therefore, negating bona fide acquisition which requires registration as a prerequisite, and having the pledge right acquire counteraction effect upon registration, is a remedial measure for defective pledge rights under the modern registration-counteraction principle. This reflects the legislator's consideration of the interests between the true rights holder and third parties.[5]

#### **3.2. Mitigating the Prescriptive Formal Requirements of Pledge Contracts**

Article 427 of the Civil Code occupies a pivotal position within the entire security interest system. It serves as an

important legal basis for the creation and operation of pledge rights and plays a crucial role in maintaining the stability of the security interest system. Choosing the registration-counteraction principle for establishing data intellectual property pledges necessitates, under the "agreement + delivery" pledge creation model, separating the substantive elements from the formal elements within the mandatory provisions of Article 427 of the Civil Code. This achieves a mitigation of the prescriptive formal requirements of this article and resolves difficulties in its legal application.

First, introduce a functionalist interpretive method for mitigation. Mitigating the prescriptive formal requirements of the pledge contract does not directly negate the provisions of Article 427 of the Civil Code. Instead, it starts from the perspective of interpretation theory, reading the mandatory clauses in the pledge contract from the viewpoint of legal values.[6] The functionalist interpretive method emphasizes the openness and adaptability of law. Introducing a functionalist interpretive method at the theoretical level can effectively mitigate the formalism of Article 427 of the Civil Code and provides significant guidance for resolving issues in legal application and judicial practice.

Second, distinguish between essential and non-essential clauses. Besides introducing a functionalist interpretive method, the prescriptive clauses stipulated in Article 427 of the Civil Code can also be mitigated by distinguishing between "essential clauses" and "non-essential clauses". Specifically, a strict and compliant attitude should be adopted towards clauses identified as essential, whereas control over non-essential clauses does not require a rigid, dogmatic approach. This serves to mitigate the difficulties in applying the law to formal contracts. Distinguishing between essential and non-essential clauses allows the parties, while highlighting the core content of the pledge contract, to focus more on the substantive elements of the contract during its conclusion, avoiding neglect of the contract's substance due to excessive focus on its form. This approach helps to mitigate the prescriptive formal requirements of Article 427 of the Civil Code, enhance transaction efficiency, and reduce increased transaction costs resulting from cumbersome contract terms.

### **3.3. Unifying the Identification Standards for the Object of the Pledge Right**

Data intellectual property pledge financing, as an important institutional arrangement for promoting data circulation and innovation, plays a pivotal role in the development of the digital economy. However, inconsistent standards for identifying the object of the pledge right across different regions have resulted in the spatial effect of the pledge object often being limited to a single province or city. When conducting cross-administrative regional data intellectual property pledge financing, situations objectively exist where, although the pledge right is created, it fails to gain approval during the pledge registration process due to the ineligibility of the pledge object. This subsequently leads to the lack of a public notification step in the broad sense of pledge creation. Unifying the standards for identifying data intellectual property can both smooth the public notification step in the creation of data intellectual property pledges and provide a more solid legal foundation for data intellectual property pledge financing, thereby effectively stimulating the innovative vitality of market entities.

First, clarify the basic principles for authorization review.

Currently, China's pilot work on data intellectual property is still ongoing, and various pilot locations are largely operating independently. This has led to the existence of multiple standards and methods for identifying data intellectual property. Clarifying the basic principles for authorizing and reviewing data intellectual property can establish the fundamental framework for identifying the object of the data intellectual property pledge right. Defining these basic principles is both the most critical aspect of unifying the identification of the object of the data intellectual property pledge right and an inevitable requirement for improving the data intellectual property system itself. Comprehensively considered, the basic principles for authorizing and reviewing data intellectual property should include the principle of legality, the principle of authenticity, the principle of innovation, and the principle of practicality.

Second, construct a unified system for review content. Currently, the problem of inconsistent data intellectual property identification standards in China is primarily reflected in the inconsistent content of data intellectual property reviews. Different regions and departments operate based on their own understanding and habits, and widespread discrepancies exist among local registration agencies in grasping key review points such as the legality of data sources and the originality of data content. Constructing a unified system for the review content of data intellectual property can provide pledge registration authorities with clear identification standards and is conducive to improving the form of legal norms governing the creation of data intellectual property pledges.

## **4. Optimization of the Realization of Security Rights in Data Intellectual Property Pledge Financing**

### **4.1. Introducing Compulsory Administration as a Method for Pledge Realization**

Article 490 of the Judicial Interpretation of the Civil Procedure Law specifies the applicable objects of the compulsory administration system as "property that cannot be auctioned or sold during the execution process," but it does not specify the types and scope of such property. Theoretical perspectives and interpretations on this issue also vary. For instance, some scholars propose that immovable property, ships, and aircraft should be considered as objects of compulsory administration. Others argue that objects such as ships and aircraft have special characteristics and, considering national security and public interests, should not be subject to compulsory administration. Yet another view advocates that, given the continuous emergence of new forms of property, to adapt to societal development, the application of compulsory administration should not be limited to immovable and quasi-immovable property. Instead, its scope should be extended to all types of property, explicitly stipulating it as a method for pledge realization.[7] In general, existing research remains confined to debates over applicability within traditional types of property. However, as the types and scope of collateral continue to expand, there is a need, driven by corporate financing demands, to shift the utilization of property from its physical value to multiple values. This provides a more practical foundation for including more types of collateral under compulsory administration. It is noteworthy that the compulsory administration system can also play a role in the

realization of security rights in data intellectual property pledge financing.

Firstly, compulsory administration can better realize the value of security rights in data intellectual property. The separability of real rights functions forms the theoretical basis for compulsory administration. Data intellectual property inherently possesses both exchange value and use value. In daily usage, its use value is often prioritized, whereas during the pledge financing process, its exchange value is more prominent. When it comes to realizing the security right, if the liquidation price exceeds the debt, the security right can be smoothly realized; if the liquidation price is lower than the debt, realizing the security right becomes difficult. It is important to note that the value of data intellectual property is not static; it is influenced by both its intrinsic quality and market conditions. In such cases, opting for traditional methods of realizing security rights may diminish its value. Through the compulsory administration of security rights in data intellectual property, waiting for the rectification of property rights or for periods of high market demand before liquidation can better balance the exchange value and use value of data intellectual property, thereby maximizing its utility.

Secondly, compulsory administration balances the principles of fairness and efficiency in the realization of security rights in data intellectual property. The choice of method for realizing security rights in data intellectual property involves difficult value judgments, essentially presenting a choice between the principles of efficiency and fairness. Traditional methods of realizing security rights tend to prioritize efficiency, aiming to quickly liquidate the collateral to repay the debt. However, in cases where the value of the collateral far exceeds the debt amount, forced liquidation may not be fair to the protection of various creditors. If there are multiple encumbrances on the collateral, the interests of other creditors could be affected. Compulsory administration, on the other hand, can balance both fairness and efficiency. [8] Although it may sacrifice some efficiency, it ensures the smooth realization of creditor's rights. Particularly in situations with multiple creditors, compulsory administration can enhance the value of data intellectual property. This approach can, to some extent, avoid the scenario where efficiency-focused realization of creditor's rights harms the interests of other stakeholders, and it can also address the balance of interests between the debtor or third parties and the creditors during enforcement, thereby improving the efficiency of realizing security rights in data intellectual property.

#### **4.2. Clarifying the Review Standards for Special Procedures in Realizing Security Rights**

From data intellectual property pledge financing activities, it is evident that registration plays a crucial role, as it carries public notification and credibility effects. Special procedures, compared to litigation, are more efficient and convenient. In practice, special procedures for realizing security rights can function effectively by leveraging the characteristics of pledged rights, reducing the concerns of fund providers with their low cost and high efficiency, thereby alleviating difficulties and high costs in pledge financing. While the Civil Procedure Law stipulates the realization of security rights, and the Judicial Interpretation provides detailed regulations on jurisdiction and application materials, specific issues

regarding the realization of rights pledges—especially with the increasing frequency of data intellectual property pledge financing activities—still present many challenges in the operation of special procedures.

When realizing data intellectual property security rights, specialized registration agencies have clearly defined procedures for establishing pledge registration, and review is required for establishment. This endows data intellectual property pledge registration with public credibility. On this basis, once a dispute over the realization of the security right arises, the court only needs to conduct a formal review of the case, aligning with the convenience and efficiency pursued by special procedures. There is no need to repeat reviews on fundamental issues, which would waste judicial resources. The special procedure for realizing data intellectual property security rights inherently functions to prevent the devaluation of pledged rights due to the complexity of litigation procedures. The formal review standard is consistent with the value pursuit of special procedures. Therefore, in cases involving the realization of registered data intellectual property security rights, it is reasonable to conduct only a formal review of the application materials submitted by the parties.

#### **4.3. Improving the Market for Realizing Data Intellectual Property Security Rights**

The realization of data intellectual property security rights is crucial to the smooth conduct of pledge financing activities. Addressing issues such as difficulties in trading and realization requires improving the data intellectual property trading market.

First, leverage the efficiency of big data exchanges in realizing security rights. Based on the characteristics of data intellectual property and cooperative models, big data trading platforms can play a role in data intellectual property trading and the realization of security rights. Specifically: Firstly, big data exchanges can act as intermediaries and matchmakers for data intellectual property. By collaborating with data intellectual property registration agencies and administrative organs such as courts, they can provide information to trading parties, helping to resolve difficulties in the realization and trading of data intellectual property. Secondly, big data exchanges can play a key role in security assurance and certification. The collaboration between big data exchanges and administrative organs on data intellectual property registration information can effectively provide public credibility, mitigate infringement risks in data intellectual property trading, and offer security certification. This enables parties involved in data intellectual property trading or realization to conduct circulation activities efficiently and securely.

Second, explore methods for valuing data intellectual property. According to Article 127 of the Civil Code, data intellectual property is an intangible property right, and pledge financing activities have already been conducted in practice. The valuation of data intellectual property is also a critical step in reflecting its value. As mentioned, data intellectual property possesses both use value and exchange value. However, there is no consensus on how to determine its overall value or provide a clear valuation standard for pledge financing activities. Therefore, it is particularly important to design a suitable valuation method based on the characteristics of data intellectual property. Building a data intellectual property valuation system requires attention to its

use value, which influences exchange value and, consequently, pledge financing activities and the realization of security rights. Due to the intangible and contextual nature of data intellectual property, valuation cannot remain solely "static" but must focus on "dynamic" aspects. Various valuation methods should be weighed and used in data intellectual property trading and pledge financing activities, with regular monitoring of data intellectual property. This not only concerns maximizing the value of data intellectual property but also relates to the safeguarding of creditors' security rights. Therefore, data intellectual property valuation should be integrated throughout the entire process of data intellectual property pledge financing activities.

## 5. Conclusion

Data intellectual property pledge financing involves both challenging value judgments and intricate technical specifications. Building upon fundamental theories and informed by empirical research, this study has identified genuine issues, comprehensively presented and objectively described the actual operational status and existing problems in data intellectual property pledge financing. It has consequently provided a set of theoretically sound, practically actionable, and contextually appropriate countermeasures and suggestions that align with the realities of data intellectual property pledge financing.

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