

A Study of the Wenzhou Approach to Full-Chain Intellectual Property Protection of Commercial Data: Based on the “3+1” Coordinated One-Stop Processing Model

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Abstract: Commercial data protection has evolved beyond infringement prevention into a governance issue involving rights confirmation, compliant circulation, value realization, and legal remedies. Using Wenzhou and its “3+1” Coordinated One-Stop Processing Model as a case study, this article examines local efforts to build full-chain intellectual property protection for commercial data. Supported by the China (Wenzhou) Data Security Port, the model coordinates data property-rights, data intellectual-property, and data-asset registration with data-security compliance assessment. It establishes a framework linking front-end rights confirmation, midstream circulation and value creation, and back-end legal safeguards. Registration and compliance documentation improve data traceability and evidentiary capacity; product development, compliance review, pledge financing, and balance-sheet recognition facilitate value realization; and specialized adjudication, procuratorial work, arbitration, and notarization strengthen legal protection and remedies. The Wenzhou experience suggests that effective commercial-data protection depends less on the number of certificates or platforms than on coordination among rights confirmation, compliance, circulation, financing, and remedies. Key challenges remain, including uncertain legal effects of registration, inconsistent valuation and accounting standards, and limited evidentiary coordination and cross-regional mutual recognition. Further reforms should strengthen dynamic compliance review, rights-change mechanisms, data-asset valuation, and inter-institutional coordination to improve the model’s stability and replicability.

Keywords: Commercial Data Intellectual Property; Full-Chain Protection; the “3+1” Coordinated One-Stop Processing Model; Market-Oriented Allocation of Data Elements.

1. Introduction

Against the backdrop of the ongoing market-based allocation of data factors, commercial data is no longer merely an aggregation of information that naturally accrues during business operations; it has progressively taken on a composite form that simultaneously possesses resource, asset, and governance attributes. As the development and utilization of data continue to extend from internal enterprise management to broader scenarios such as product trading, financial credit enhancement, asset accounting, public governance, and judicial relief, the question of how to build a full-chain protection system for commercial data—one that covers rights confirmation, circulation and utilization, value realization, and dispute resolution—has become an important practical issue in the current construction of data infrastructure institutions. Compared with abstract normative discussion, institutional experimentation at the local level better reveals the real operating conditions of rules, and is therefore better suited to serve as an important window for observing the evolution of China’s commercial data protection regime.

Relying on the China (Wenzhou) Data Security Port, Wenzhou has continuously advanced multiple explorations—including the aggregation of data resources, the development of data products, data intellectual property registration, the authorized operation of public data, the assetization and utilization of data, pledge financing, and specialized judicial guarantees—gradually forming an institutional practice system oriented toward the circulation and utilization of data

factors. Wenzhou institutional exploration of commercial data has extended from early registration pilots to multiple dimensions including resource supply, product development, market circulation, value transformation, cross-regional collaboration, and rule-of-law safeguards.

Among existing explorations of Wenzhou, the “3+1” Coordinated One-Stop Processing Model introduced by the Wenzhou Municipal Administration for Market Regulation merits particular attention. This model groups data property rights registration, data intellectual property registration, and data asset registration together as the “Three Certificates,” and treats data security compliance review separately as “One Compliance”; through a single application, an enterprise may concurrently process four items of business, and the model is therefore also referred to in public communications as the concurrent processing of “Four Certificates” for data factors. The significance of the “3+1” Coordinated One-Stop Processing Model extends beyond procedural optimization. By integrating registration, review, and mutual information recognition, it attempts to bring the rights expression of commercial data, circulation preparation, assetization and utilization, and security compliance within a single institutional logic, thereby establishing a connection among the formation of data rights and interests, market transactions, and risk control. In this sense, the model offers an appropriate analytical entry point for studying the full-chain protection of commercial data: the front end involves rights expression, source explanation, and rights-confirmation certificates; the middle end connects compliance review, product development, transactional transformation, financing application, and asset accounting; and the back end extends

to evidence fixation, specialized dispute resolution, and rule-of-law relief.

On this basis, this article takes Wenzhou as its object of observation and the “3+1” Coordinated One-Stop Processing Model as its analytical entry point, examining the local practice of full-chain protection of commercial data. The “full-chain protection of commercial data” as used in this article is not confined to data intellectual property registration in the narrow sense or to individual transaction rules; rather, it refers to the holistic institutional arrangement formed around commercial data, covering front-end rights confirmation, middle-end circulation, utilization and value realization, and back-end rule-of-law safeguards and cross-regional coordination. The article first analyzes the practical foundations on which Wenzhou has formed its full-chain protection mechanism for commercial data, then examines the operating logic of such links as registration and rights confirmation, compliance review, product development, financing application, and judicial guarantees; on this basis, it summarizes the practical outcomes of the Wenzhou approach and analyzes its institutional bottlenecks along three dimensions—rights confirmation, value transformation, and rule-of-law coordination. This article aims to reveal the practical logic by which local commercial data protection moves from individual institutional innovations toward chain-based governance, and to provide a local sample for understanding the evolutionary characteristics of “institution first, practice follows through, and rules keep pace” in China’s market-based reform of data factors.

2. The Practical Foundations of Full-Chain Protection of Commercial Data in Wenzhou

(1) Wenzhou Local Practice in the Context of the Market-Based Reform of Data Factors

The formation of full-chain protection for commercial data is rooted, first and foremost, in the institutional evolution of China’s market-based allocation reform of data factors. In 2020, the Opinions of the Central Committee of the Communist Party of China and the State Council on Building a More Perfect System and Mechanism for the Market-Based Allocation of Factors placed data alongside land, labor, capital, and technology, proposing to accelerate the cultivation of a data factor market. In 2022, the Opinions of the Central Committee of the Communist Party of China and the State Council on Building Data Infrastructure Institutions to Better Play the Role of Data Factors constructed a foundational institutional framework around data property rights, circulation and trading, income distribution, and security governance, and proposed exploring an institutional arrangement separating the rights to hold data resources, the rights to process and use data, and the rights to operate data products. Thereafter, the National Data Bureau was established, and institutions such as the construction of a unified national data market, the development and utilization of public data resources, data property rights registration, and authorized operation were continuously advanced; the allocation of data factors gradually shifted from policy advocacy toward rule construction and scenario-based implementation.

Zhejiang was among the first to incorporate data factor reform into its agenda for local institutional innovation. In 2025, Zhejiang issued the Construction Plan for the Zhejiang

Provincial Comprehensive Pilot Zone for Data Factors, deploying relevant action tasks around matters such as clarifying data property rights and improving the quality of data resource supply. As one of the provincial pilot cities for data property rights registration, Wenzhou has carried out supporting institutional exploration in areas such as data property rights registration management, objection handling, review guidelines, and dispute mediation. Data reform of Wenzhou is therefore not an isolated local innovation, but unfolds against the dual background of national data infrastructure construction and the construction of the Zhejiang Provincial Comprehensive Pilot Zone for Data Factors.

Against this institutional background, Wenzhou has gradually formed a representative sample of commercial data governance. In May 2022, Wenzhou planned and launched the construction of the China (Wenzhou) Data Security Port, positioning it as an important platform for exploring the market-based allocation reform of data factors. Thereafter, Wenzhou has continuously advanced institutional practices in areas such as data intellectual property registration, data resource aggregation, data product development, the authorized operation of public data, data assetization and utilization, financial credit enhancement, and specialized judicial guarantees, initially forming a full-chain protection model. Judging from publicly available data, Wenzhou data factor practices have reached a considerable scale. As of June 2026, Wenzhou had cumulatively registered 2,127 data intellectual property items, covering 14 industry sectors. [1] As of May 2026, the Data Security Port had aggregated 1,215 data-ecosystem enterprises, listed 752 data products, registered over 28,000 data resources, collected over 130 billion records of public data, and built 84 high-quality datasets. [2] Wenzhou data infrastructure has also achieved interconnection with 22 cities; the “Hundred Cities Initiative” covers 61 key cities, has jointly built urban data operation communities with 48 localities, and has seen relevant data products implemented in 23 cities. These figures reflect not mere quantitative growth, but the fact that data factor allocation has begun to exhibit chain-based characteristics—ranging from rights confirmation to resource supply, from product development to market utilization, and from local experimentation to cross-regional coordination. It should be noted that the number of data intellectual property registrations, the number of enterprises aggregated at the Data Security Port, the number of registered data resources, the number of listed data products, and the number of interconnected cities each correspond to different statistical objects and institutional links, and cannot be substituted for one another or simply aggregated. Taken together, however, these indicators show that commercial data protection is no longer confined to a single registration pilot, but has entered a development stage featuring the participation of multiple actors, the accommodation of multiple types of scenarios, and coordinated advancement across multiple departments.

(2) The Formation of the Data Security Port Platform and the Local Institutional Vehicle

The full-chain protection of commercial data has been able to take shape relatively quickly is closely related to the sustained construction of the Data Security Port as a platform vehicle in Wenzhou. In terms of functional positioning, the Data Security Port is not merely a park space; it is a comprehensive institutional platform with multiple attributes, including actor aggregation, resource gathering, product

circulation, rule experimentation, and cross-regional collaboration. The Data Security Port has achieved the aggregation of resources such as data-ecosystem enterprises, data products, registered data resources, high-quality datasets, and the supply foundation of public data. At the same time, Wenzhou has implemented 17 national pilots and 18 industry-level data laboratories and innovation platforms, and has undertaken 6 categories of national data infrastructure construction pilots, including data marketplaces, trusted data spaces, privacy-preserving computation, blockchain, data elements, and the “data internet.” [3] The significance of the Data Security Port lies in the fact that it provides an institutional space that can be operated in an organized manner for the full-chain protection of commercial data. On the one hand, the aggregation of enterprises, platforms, datasets, products, and service providers within the same field helps reduce the coordination costs of institutional innovation and enhances the efficiency of articulation among registration, trading, compliance, financing, and dispute resolution. On the other hand, the Data Security Port has not remained at the level of static data aggregation; through the authorized operation of public data, data product development, data trading services, cross-regional interconnection, and back-end rule-of-law safeguards, it has enabled commercial data protection to be genuinely embedded in concrete application scenarios.

Accordingly, within the Wenzhou approach, the Data Security Port is not only the physical space in which reform takes place, but also an important institutional vehicle connecting front-end rights formation, middle-end circulation and utilization, and back-end relief and safeguards.

(3) The Institutional Genesis of the “3+1” Coordinated One-Stop Processing Model

Through the combined effect of the accumulated practice of data intellectual property registration and the support of the Data Security Port platform, the “3+1” Coordinated One-Stop Processing Model came into being. The emergence of this model responds to the institutional fragmentation that enterprises face in the course of data development and utilization: data intellectual property registration, data property rights registration, data asset registration, and security compliance review originally corresponded to different institutional objectives and application procedures, and if an enterprise applied for them one by one, it might face problems such as repeated submission of materials, inconsistent review standards, lack of information sharing among departments, and difficulty in mutually converting outcomes.

Through the “3+1” Coordinated One-Stop Processing Model, Wenzhou has brought data property rights registration, data intellectual property registration, data asset registration, and data security compliance review within a coordinated processing framework. In terms of institutional nature, the first three are primarily registration-confirmation matters centering on data holding, the expression of rights and interests, and value measurement; data security compliance review, by contrast, primarily examines data sources, processing activities, security risks, and circulation boundaries. The “3+1” formulation therefore avoids simply equating compliance review with a registration certificate, while also emphasizing that security compliance is not an additional requirement external to data circulation, but an important precondition for data rights and interests to enter trading, financing, and other utilization scenarios.

At the level of enterprise services, this model manifests as “one application, four concurrent processes,” commonly referred to as the concurrent processing of “Four Certificates.” At the level of institutional operation, its more important value lies in promoting relatively consistent material foundations and review coordination across different departments and platforms for the same data object. Relevant reports disclose that, by promoting mutual information recognition and coordinated handling among platforms, the mechanism aims to reduce repeated declarations, avoid duplicate reviews, and compress processing time by more than 60%. In this way, enterprises need not repeatedly explain the sources, processing rules, usage boundaries, and value basis of the same data resource across multiple links. Moreover, the competent departments can reduce duplicate reviews on the basis of mutual information recognition and enhance the usability of institutional outcomes in subsequent trading, financing, and dispute resolution.

It should be recognized, however, that the “3+1” Coordinated One-Stop Processing Model does not mean that a single processing replaces all subsequent substantive review. Data property rights, data intellectual property, data assets, and security compliance each address different legal issues and apply to different scenarios; registration, review, platform logs, notarized evidence preservation, and transaction contracts likewise each bear different evidentiary functions. The substance of coordinated processing should be the establishment of a preliminary mechanism for material sharing, procedural articulation, and risk identification, rather than the automatic confirmation of data source, completeness of authorization, transaction performance, or tort liability through a single approval. It is precisely within this boundary that the “3+1” Coordinated One-Stop Processing Model constitutes the institutional starting point of full-chain protection for commercial data, rather than the endpoint of full-chain protection itself.

(4) The Basic Links of Full-Chain Protection of Commercial Data

Wenzhou’s full-chain protection of commercial data may be summarized as the institutional architecture of “front-end rights confirmation—middle-end circulation—back-end safeguards.” The front end is centered on registration and rights confirmation; it has formed large-scale data intellectual property registration practices and incorporated institutional expressions such as data property rights and data assets into the coordinated processing framework, thereby giving commercial data clear rights certificates and an institutional identity. The middle end covers the dual dimensions of resource governance and value realization: on the one hand, through preparatory procedures such as data resource collation, dataset construction, product packaging, and compliance review, it facilitates the layered transformation of “resource—dataset—product”; on the other hand, through mechanisms such as product listing, pledge-based credit enhancement, balance-sheet recognition of data assets, and capital contribution valued in data, it drives the leap of data from being registrable to being usable and value-adding. The back end, supported by the coordinated operation of the Data Resource Tribunal, the Procuratorial Office, the Arbitration Court, and notarization institutions, constructs a composite safeguard system covering tort relief, dispute mediation, criminal regulation, and evidence fixation, the practical operation of which has already taken initial shape.

It can thus be seen that the full-chain characteristics

presented by Wenzhou's commercial data protection take the accumulation of registration practice as their starting point, the aggregation of the Data Security Port platform as their support, and the "3+1" Coordinated One-Stop Processing Model as their hub, gradually forming an institutional framework for the full-chain protection of commercial data through market transformation, rule-of-law safeguards, and cross-regional coordination. This framework remains in the process of development and improvement, but it has already provided a clear object of analysis for the subsequent examination of its operating mechanism, practical outcomes, and real-world bottlenecks.

3. The Operational Unfolding of Full-Chain Protection of Commercial Data in Wenzhou

(1) The Rights-Expression Mechanism Starting from Front-End Registration and Rights Confirmation

Before commercial data enters the circulation market, it is first necessary to resolve questions such as who holds the data, how it is formed, and within what scope it may be used. Wenzhou takes data intellectual property registration as its foundation and incorporates data property rights registration, data asset registration, and data security compliance review into the "3+1" coordinated processing framework, providing a preliminary external expression for enterprises' data holding, processing and utilization, and income distribution.

The function of data intellectual property registration does not lie in automatically creating an absolute right in the traditional property-law sense; rather, it lies in providing data processors with an identifiable rights certificate through the recording of the registered subject, the data collection, the processing rules, and the relevant rights and interests. Relevant rules of Zhejiang Province have already positioned the data intellectual property registration certificate as preliminary evidence for the holding of data collections, circulation and trading, income distribution, and the protection of rights and interests, and have encouraged its admission into scenarios such as administrative enforcement, judicial adjudication, and trading and financing. The main role of registration therefore lies in enhancing the identifiability and provability of commercial data, providing foundational materials for subsequent trading, financing, asset accounting, and rights defense.

A registration certificate can prove the fact of registration and the information it records, but it cannot, by itself, prove that the source of the original data is wholly lawful, that the authorization chain is free of defects, or that the data processing did not infringe upon personal information, trade secrets, or other prior rights and interests. The significance of the "3+1" Coordinated One-Stop Processing Model lies precisely in the preliminary articulation of front-end rights expression with compliance review. Data property rights, data intellectual property, and data asset registrations each emphasize the expression of holding and circulation relationships, the rights and interests in data collections, and value measurement, respectively; data security compliance review, in turn, conducts risk identification around source legality, processing rules, security risks, and circulation boundaries. This coordination enables enterprises to form relatively unified foundational materials around the same data object, reducing the cost of repeatedly explaining the source, usage, boundaries, and value basis in subsequent scenarios

such as trading and financing. It should be recognized, however, that coordinated processing does not equate to a single registration being valid for life. During subsequent development, combination, authorization, and cross-regional circulation, commercial data may still undergo changes in usage, adjustments in the scope of authorization, and changes in compliance risk. The front-end mechanism of Wenzhou should therefore be understood as a rights-expression mechanism in which registration forms a preliminary certificate, compliance provides a risk explanation, and subsequent utilization continuously reinforces it.

(2) The Circulation Mechanism Centered on Product Development and Compliance Review

Registration is merely the starting point of data circulation; whether commercial data can genuinely enter the market also depends on whether it can be transformed, through governance, processing, and compliance review, into data products that are presentable, callable, and deliverable. The circulation mechanism of Wenzhou takes the transformation of "resource—dataset—product—service" as its main thread and embeds security compliance review into the product development and circulation-preparation stages.

From tens of thousands of registered data resources to high-quality datasets, data products listed on the Data Security Port, and authorized public-data resources, these respectively correspond to resource supply, quality governance, productized supply, and the public-data foundation, and should not be conflated with one another. Data resources must undergo processing such as cleaning, desensitization, aggregation, tagging, modeling, or interfacing, and must clearly define product functions, scope of application, quality standards, delivery methods, and liability boundaries before they can form circutable data products.

In this process, data security compliance review plays a key role. Wenzhou has incorporated compliance review into the "3+1" Coordinated One-Stop Processing Model, so that it is no longer merely an ancillary procedure after product formation, but a risk-control mechanism advanced in parallel with rights expression and product development. Compliance review principally concerns whether data sources are lawful, whether the processing of personal information has a lawful basis, whether authorization boundaries are clear, whether processing and utilization exceed the necessary scope, and whether data-security and trade-secret risks exist. Publicly available materials show that Wenzhou has integrated more than 10 departments—including those of justice, finance, market regulation, and data—to establish a compliance service working group, [4] and regularly conducts risk reviews at the Data Security Port; as of the relevant reports, 16 review sessions had been completed, with more than 100 products approved [5].

This mechanism helps reduce the costs enterprises incur in repeatedly declaring to and being reviewed by different departments, and also helps data products form a clearer compliance foundation before entering trading, financing, and cross-regional application. The validity of compliance review, however, should still be understood dynamically: it can only show that a given product has undergone review under specific time, specific usage, and specific material conditions, and does not mean that the product is automatically and continuously compliant in all subsequent usage scenarios. When data sources, processing rules, the scope of authorization, or the region of application change, supplementary review or re-evaluation may still be required.

The listing of data products on the Data Security Port and cross-regional interconnection have further expanded the application boundaries of the circulation mechanism. The data infrastructure of Wenzhou has achieved interconnection with multiple cities, the "Hundred Cities Initiative" covers key cities, and relevant data products have been implemented in multiple cities. Product listing, city interconnection, and product implementation, however, respectively correspond to supply display, infrastructure connection, and the realization of application scenarios, and cannot yet be directly equated with stable transactions or sustained revenue. The actual effectiveness of the data circulation mechanism still requires further verification through outcome-based indicators such as product calls, the number of transactions, the number of authorizations, and actual settlement.

(3) The Value-Realization Mechanism Oriented toward Pledge Financing and Balance-Sheet Recognition

The value of commercial data is not automatically realized upon completion of registration; only when it enters scenarios such as financing, accounting treatment, trading, or capital contribution can data be transformed from an internal enterprise resource into an asset identifiable by market actors and financial institutions. Wenzhou has carried out explorations around data intellectual property pledge financing, credit-enhancement support, balance-sheet recognition of data assets, and valued utilization, extending data protection from "rights confirmation" to "value realization."

The practice of Longgang is representative. According to relevant materials from Longgang Municipality, as of 2025, Longgang had completed 530,000 enterprise data evidence-preservation records and 370 data intellectual property registrations, and leveraged RMB 400 million in enterprise financing through a new model of data pledge. [6] This practice shows that data intellectual property can, under certain conditions, enter the enterprise financing-evaluation system and become an auxiliary basis for credit enhancement and risk identification. Huahao Nonwovens Co., Ltd. completed data intellectual property registration for the "test data for determining the breaking strength of nonwoven products," and obtained RMB 200 million in loan credit and RMB 220,000 in risk coverage through credit-enhancement financing, making it a typical sample of data empowering industrial quality control. [7] The foregoing cases show that the financial value of data is usually expressed not as the direct transfer of raw data, but as the recognition by financial institutions of the technical capability, operational capability, and future earnings capacity carried by the data. Data registration, compliance materials, value assessment, bank due diligence, and insurance or guarantee arrangements together constitute the foundation of financing support. In addition to pledge financing, Ouhai has advanced both balance-sheet recognition of data assets and credit-enhancement financing in parallel. According to a disclosure by the Ouhai District Government in December 2025, relying on the construction of the provincial data intellectual property ecosystem pilot zone, the district had cumulatively completed over 900 registration reviews, guided 189 registrations, and promoted more than RMB 2.3 million in balance-sheet recognition of data intellectual property and RMB 90 million in credit-enhancement financing. [8] A case of capital contribution valued in data intellectual property has also emerged in Rui'an. This reflects the fact that Wenzhou has already attempted to introduce data rights and interests into

different scenarios, such as financing, accounting, and corporate capital operations.

However, "credit approval," "actual loan disbursement," "pledge financing," "credit-enhancement financing," "leveraged financing," and "balance-sheet recognition" should not be used interchangeably. They respectively reflect the amount approved by a financial institution, the funds actually obtained by the enterprise, guarantee or credit-enhancement support, policy or market leverage effects, and accounting-recognition results, and cannot be simply aggregated. The same distinction should be drawn between the "listing" and the "actual transaction" of data products. The value-realization mechanism of Wenzhou for commercial data is therefore still in the exploratory stage, and its stability depends on a unified system for value assessment, risk sharing, transaction settlement, and statistical disclosure.

(4) The Rights-Relief Mechanism Supported by Back-End Judicial Safeguards

During the development, trading, and use of commercial data, multiple disputes may arise concerning ownership, contract performance, personal-information protection, trade secrets, unfair competition, and the authenticity of electronic evidence. Whether front-end registration and middle-end circulation can play a stable role ultimately depends on whether specialized, verifiable relief channels are available once a dispute arises. Centered on the Data Security Port, Wenzhou has deployed a Data Resource Tribunal, a Data Resource Procuratorial Office, a Data Resource Arbitration Court, a Notarization Service Center, and related security-governance forces, initially forming a back-end safeguard pattern in which adjudication, procuratorial work, arbitration, notarization, and security governance cooperate with one another.

The Data Resource Tribunal is the core of this mechanism. The tribunal implements the "three-in-one" centralized adjudication of criminal, civil, and administrative cases, and is staffed with specialized personnel such as technical investigators and data analysts. As of April 2026, the tribunal had cumulatively accepted 1,539 data resource cases of various types and concluded 1,485. [9] Its scope of accepted cases concerns not only data rights and interests and personal-information protection, but also covers composite disputes such as data service contracts, platform operation, online unfair competition, and trade secrets. This specialized adjudication mechanism helps place technical facts, transaction rules, and legal liability within a relatively unified review framework.

The Data Resource Arbitration Court, for its part, provides a specialized dispute-resolution channel for transactional disputes. As of August 2026, the Arbitration Court had concluded 20 data resource arbitration cases with a total amount in dispute of RMB 150 million, and had jointly established a data factor mediation service station with the Wenzhou Data Trading Center to explore a mechanism of "specialized mediation + arbitral confirmation." [10] The Notarization Service Center has provided data evidence-preservation and evidence-preservation services more than 200 times, offering a corroborating means for fixing electronic data, platform records, and transaction processes.

The key to back-end safeguards, however, lies not merely in the establishment of institutions, but in whether front-end materials can effectively enter the dispute-resolution process. Registration certificates, compliance reviews, platform logs, notarized documents, and transaction contracts each prove

different matters, and no single material is sufficient to automatically prove complete data rights, lawful sources, or tortious facts. The next step for Wenzhou still requires improving the evidentiary interfaces and information-sharing mechanisms among registration, evidence preservation, trading, enforcement, and the judiciary, so that front-end rights expression and middle-end transaction records can be reliably retrieved, verified, and admitted in back-end relief.

4. The Practical Outcomes of Full-Chain Protection of Commercial Data in Wenzhou

(1) Front-End Outcomes of the Confirmation and Utilization of Commercial Data Rights

Commercial data protection in Wenzhou has first achieved a transition from data being difficult to express to data rights and interests being identifiable. Traditional enterprise data has long been dispersed across business systems and management processes, making it difficult to form externally identifiable rights certificates. Taking data intellectual property registration as its foundation, Wenzhou has incorporated data property rights, data assets, and security compliance review into the “3+1” coordinated processing framework, enabling enterprises to form, around the same data object, a complete set of materials covering rights explanation, processing rules, and value proof.

The direct outcome of this mechanism lies in the enhancement of the external identifiability of data rights and interests. Data intellectual property registration does not automatically confer upon enterprises absolute and exclusive data rights, but it can form preliminary proof of the holding, processing, and utilization status of data collections, providing foundational materials for subsequent trading, financing, asset accounting, and dispute resolution. Wenzhou has extended data intellectual property registration to a variety of scenarios including industrial manufacturing, industry services, livelihood protection, and medical health, and has strengthened enterprises’ understanding of registration rules and application materials through the release of benchmark templates. This has transformed data registration from an exclusive tool of digital enterprises into a data-management tool serving real-economy enterprises.

The “3+1” Coordinated One-Stop Processing Model has further enhanced the usability of the rights-confirmation mechanism; the confirmation of commercial data rights has begun to shift from the mere acquisition of a certificate toward a rights-expression mechanism serving subsequent business activities. Through a single application, an enterprise may concurrently enter the procedures for data property rights, data intellectual property, data assets, and security compliance, reducing the burden of repeatedly submitting source explanations, processing rules, and value materials for the same data resource. For the competent departments, mutual information recognition among the relevant platforms also helps reduce duplicate review; for enterprises, front-end registration and compliance materials can serve as foundational documents for product development, transaction negotiation, financial due diligence, and risk control. This outcome, however, should still be understood with caution. A registration certificate is primarily a preliminary credential; it cannot, by itself, prove that data sources are wholly lawful, that the authorization chain is complete, or that subsequent use remains continuously compliant. Its value lies in

providing an institutional starting point that is “identifiable, explainable, and enforceable,” rather than replacing all substantive review through a single registration.

(2) The Economic Outcomes of the Value Transformation of Commercial Data

The second outcome is the initial opening of channels through which data may be transformed into financing support, asset recognition, and product supply. Previously, data was difficult to bring into the financial system because its rights boundaries were unclear and its value was hard to assess; through the coordinated configuration of registration, compliance, assessment, credit enhancement, and trading services, Wenzhou has enabled data rights and interests to become an auxiliary basis for financing and assetization-based utilization.

The practice of data intellectual property pledge is representative in Longgang. Through arrangements such as data evidence preservation, registration, and pledge-based credit enhancement, the locality has provided financing support to a group of “specialized, refined, differential, and innovative” (SRDI) enterprises, demonstrating that data rights and interests can, under certain conditions, enter the bank credit-approval and risk-identification system. As mentioned above, after Huahao Nonwovens Co., Ltd. obtained the relevant data intellectual property, it received RMB 200 million in loan credit and risk coverage, which also shows that resources that were originally difficult to quantify—such as enterprise operating data and quality-inspection data—can play a role in financial credit enhancement. The focus of this model lies not in directly “selling” raw data to banks, but in enhancing, through data registration and related materials, the identifiability of an enterprise’s intangible assets, technical capabilities, and future operational capabilities.

Wenzhou has also promoted the balance-sheet recognition and valued utilization of data rights and interests; some districts and counties have already seen cases of balance-sheet recognition, credit-enhancement financing, and capital contribution valued in data, which means that data rights and interests have entered the accounting and capital-operation systems, and has also prompted financial, valuation, and accounting actors to develop the capacity to evaluate data assets. At the same time, Wenzhou has formed a sizable supply of data products and has established a data trading service system. The growth in data product listing, trading services, and cross-regional application indicates that data resources, after governance, processing, and compliance review, have begun to enter the market in the form of products and services. However, the listing of data products does not equate to actual transactions, credit-approved amounts do not equate to actual loan disbursements, and credit-enhancement financing and leveraged financings should even less be directly added to loan balances. The economic outcomes of Wenzhou should therefore be summarized as follows: the path for the value realization of commercial data has been initially opened, but its market efficiency and financial stability remain to be verified through more unified statistical standards for trading, settlement, and financing.

(3) The Social Outcomes of Commercial Data Empowering Public Governance

The third outcome is the promotion of data factors from being internal enterprise resources and objects of market transactions to becoming tools for optimizing public governance and improving livelihood services. Aggregating

and developing various types of data under conditions of compliance, authorization, and controllable risk helps enhance the digitalization level of government decision-making, financial services, and urban operations.

Wenzhou has constructed a system covering data aggregation, resource registration, and product development, and has incorporated data sources, purposes of use, and security risks into pre-circulation compliance review. In this way, the development and utilization of public data no longer pursues only the quantity of disclosure, but places greater emphasis on “usable but invisible,” “traceable authorization,” and “bounded circulation.” This is of positive significance for preventing the abuse of public data, reducing the risk of personal-information leakage, and safeguarding the public interest. As can be seen from publicly available applications, Wenzhou has promoted the implementation in other localities of products such as the “Credit Data Treasure” and the “Generative Smart Medical Record.” [11] The former helps alleviate the problem of information asymmetry in the financing of small and medium-sized enterprises, while the latter serves the generation of medical documents and the optimization of diagnosis and treatment processes. These products show that the social value of data factors is reflected not only in market prices, but also in lowering the cost of public services, improving the efficiency of government and industry services, and improving the service experience of enterprises and the public.

In addition, specialized rule-of-law safeguard system is also of significance for public governance in Wenzhou. Through means such as the handling of data-related cybercrime, administrative public-interest litigation supervision, and procuratorial recommendations, the Data Resource Procuratorial Office responds to issues such as personal-information infringement, data abuse, and gaps in industry regulation. This path, which gives equal weight to “development and utilization” and “risk governance,” helps avoid a one-sided understanding of data factor reform as market-based development, and instead incorporates security, privacy, the public interest, and enterprise compliance together within the governance framework.

5. The Real-World Bottlenecks of Full-Chain Protection of Commercial Data in Wenzhou

(1) Rights Confirmation and the Statistical-Evaluation Foundation Remain Unstable

The functional boundaries among data intellectual property registration, data property rights registration, data asset registration, and security compliance review still need to be clarified. Data intellectual property registration can provide preliminary evidence for the holding of data collections, circulation and trading, income distribution, and the protection of rights and interests [12], yet its validity is limited: it neither automatically proves the legality of data sources, the sufficiency of personal-information authorization, or the absence of defects in processing activities, nor can it directly prove transaction performance or tort liability. In other words, registration has a probative function only in the sense of “prima facie evidence”; it does not have a rights-creating effect, much less an erga omnes effect against unspecified third parties. If an enterprise misreads the registration certificate as a complete rights certificate, or equates compliance review with a general license for the free

circulation of data, it may obscure substantive review issues such as data sources, the scope of authorization, the purpose of processing, and security risks.

At the same time, while the “3+1” Coordinated One-Stop Processing Model has achieved procedural linkage between registration confirmation and compliance review, the four items of business are not identical in their review focus, legal effect, and scope of application, and procedural coordination does not mean the conflation of effects. The first three registrations serve rights expression and value identification, and their function lies in forming an external appearance of rights and interests that can be externally identified. Security compliance review, by contrast, makes judgments about risks under specific data, specific uses, and specific processing rules, and is inherently scenario-dependent and case-specific. Once the data source, product function, scope of authorization, or region of application changes, the original compliance conclusion may lapse, requiring supplementary review or even re-evaluation. Dynamic mechanisms such as registration modification, objection handling, correction and cancellation, compliance re-review, and the lapse of rights therefore remain to be improved, so as to avoid a gap in effect between static registration and dynamic circulation.

(2) The Value-Transformation Chain Is Initially Opened but Lacks Stability

Wenzhou has initially opened the channel for data value realization through paths such as data product development, pledge-based credit enhancement, balance-sheet recognition of assets, and valued utilization, but its market-based transformation still exhibits the characteristics of strong case-by-case impetus and insufficient scaling.

On the one hand, there is no automatic correspondence among data resources, datasets, listed products, and actual transactions. On the supply side, data resources may be unable to be productized due to quality defects, incomplete authorization, the absence of scenarios, or high compliance risk; on the demand side, even if a product is listed, it may be difficult to form a stable transaction due to the absence of a pricing mechanism, unclear quality standards, unclear delivery methods, or insufficient demand. Listing volume and the value of trading services can therefore only indicate the scale of supply, and are insufficient to prove genuine market activity.

On the other hand, the data-asset valuation and risk-sharing mechanisms are not yet sound. The value of data is highly dependent on quality, update frequency, scenario fit, and compliance status; it is scenario-dependent and replicable, making it difficult to form a stable valuation benchmark comparable to that of real estate. Longgang’s pledge financing and the credit approval of Huahao Nonwovens show that data rights and interests can enhance financing availability, but their function is primarily as a credit-enhancement tool rather than an independent collateral: a registration certificate produces only prima facie evidentiary effect, and the objects of pledge rights enumerated in Article 440 of the Civil Code do not encompass data rights, so whether data rights may be independently pledged remains subject to explicit legal provision. [13] Balance-sheet recognition and capital contribution valued in data also urgently require mature arrangements in terms of valuation rules, auditing standards, value impairment, and the allocation of liability.

(3) The Rule-of-Law Safeguard and Cross-Regional Coordination Mechanisms Still Need Deepening

Wenzhou has deployed the Data Resource Tribunal, the Procuratorial Office, the Arbitration Court, the Notarization Service Center, and related security-governance forces, forming a specialized safeguard pattern covering adjudication, procuratorial work, arbitration, notarization, and regulation. However, the co-location of institutions does not automatically equate to the coordination of mechanisms; the organizational aggregation of multiple actors still needs to be further translated into stable evidentiary articulation and procedural coordination mechanisms before it can genuinely support full-chain protection.

Viewed from the perspective of the law of evidence, registration certificates, compliance opinions, platform logs, hash-value verification records, notarized documents, and transaction contracts belong to different categories of evidence, each pointing to different facts to be proved, and their probative force also exhibits a layered variation. A registration certificate produces only *prima facie* evidentiary effect with respect to the attribution of rights and interests and the legality of sources; platform logs and hash-value verification records constitute electronic data, the authenticity of which must be comprehensively assessed under Article 93 of the Provisions of the Supreme People's Court on Evidence in Civil Procedure, and technical authentication can only guarantee the formal authenticity and identity of data after it is uploaded to the chain, and cannot retroactively prove the substantive authenticity of the data prior to uploading; although notarized documents possess statutory probative force, they also extend only to the facts fixed at the time of notarization; and the evidentiary nature and admissibility of compliance opinions remain disputed in both theory and practice. No single item of evidentiary material is therefore sufficient to automatically prove complete data rights, lawful sources, contract performance, or tortious facts; only through the mutual corroboration of an evidentiary chain may the standard of proof of a "high degree of probability" in civil litigation be attained.

Cross-regional coordination also faces the difficulty of mutual rule recognition: interconnection and product implementation do not mean that data may circulate freely, and differences remain among localities in data classification and grading, authorization mechanisms, and the allocation of liability. Wenzhou would do well to focus on unifying statistical standards, establishing a full-lifecycle compliance re-review mechanism, and improving evidentiary interfaces as well as cross-regional authorization and dispute-resolution rules, so that full-chain protection may achieve stability and replicability.

6. Conclusion

Against the backdrop of the ongoing market-based allocation of data factors, commercial data protection has shifted from the single defensive issue of preventing leakage, infringement, and improper acquisition to a systemic governance issue linking rights expression, compliant circulation, value realization, and rule-of-law relief. Relying on the Data Security Port and taking the "3+1" Coordinated One-Stop Processing Model as its hub, Wenzhou has brought data property rights registration, data intellectual property registration, data asset registration, and data security compliance review within a coordinated framework, and has extended them to product development, financing-based credit enhancement, balance-sheet recognition of assets, specialized dispute resolution, and cross-regional

collaboration, initially forming a full-chain protection path for commercial data with local distinctiveness. The Wenzhou practice shows that data registration can enhance the identifiability of commercial data, compliance review delineates risk boundaries for circulation and utilization, product development and financial application drive the transformation of data resources into market value, and specialized mechanisms such as adjudication, procuratorial work, arbitration, and notarization provide back-end support for the relief of rights and interests. The core of its experience lies not in simply multiplying certificates or platforms, but in promoting, around concrete application scenarios, the formation of a coordinated relationship among rights confirmation, compliance, circulation, value realization, and relief mechanisms.

It should nonetheless be recognized that the Wenzhou model remains in a transitional stage moving from institutional innovation toward the shaping of rules. The *prima facie* evidentiary effect of registration certificates cannot substitute for substantive review of source legality, the completeness of authorization, and transaction performance; and product listing volume, the value of trading services, credit-approved amounts, and actual loan disbursements must also be strictly distinguished. The next step should be to unify the statistical standards for registration, trading, and financing, to improve the compliance re-review and rights-modification mechanisms, and to perfect cross-institutional evidentiary interfaces and cross-regional mutual rule recognition. In sum, what the Wenzhou practice demonstrates is a governance approach that takes concrete scenarios as its bond and links rights confirmation, compliance, circulation, and relief; it remains to be further tested through specific mechanisms such as the effect of registration, evidentiary articulation, and cross-regional mutual rule recognition.

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