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# Research on the Full-Chain Protection Mechanism of Data Intellectual Property in Wenzhou

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## ABSTRACT

Drawing on Zhejiang Province's reform of data intellectual property (IP) and using the China (Wenzhou) Data Security Harbor as its organisational platform, Wenzhou has gradually assembled a full-chain protection mechanism linking registration and evidence preservation, coordinated processing, compliance review, trusted circulation, value realisation and plural remedies. This article argues that the institutional logic of the mechanism is not to create an absolute exclusive right through local registration, but to safeguard lawful investment in data and its circulation and use through object identification, factual proof, risk control and conduct regulation. Registration performs a prima facie evidentiary function with respect to the fact of possession; the "3+1" Coordinated One-Stop Processing Model achieves procedural coordination rather than a merger of legal effects; compliance review and technical measures jointly contain circulation risks; and market application and judicial relief respectively discharge the functions of value realisation and rights protection. The Wenzhou pathway thus marks a shift from isolated registration to a combination of mechanisms and from ex post remedies to full-lifecycle governance. It nevertheless remains constrained by the conflation of certificates' functions, inadequate representation of dynamic data, ill-defined boundaries of compliance conclusions, unverified value-realisation effects and weak articulation with the national regulatory framework. On the premises of limited protection and functional differentiation, the article recommends specifying the legal effects of each certificate, introducing dynamic version management, adopting tiered and time-limited review, establishing outcome evaluation and repositioning local services within the emerging unified national framework for data property rights registration. Such measures would convert local experimentation into a rule-based mechanism characterised by clear boundaries, assignable responsibility and verifiable outcomes.

## KEYWORDS

Data intellectual property; Full-chain protection; Legal effects of registration; Wenzhou practice

## 1. INTRODUCTION

Data are at once reproducible, shareable and capable of repeated development, and their generation typically involves multiple actors. These attributes make it difficult to accommodate data directly within a unitary ownership structure premised on exclusive possession. Article 127 of the Civil Code confirms, by way of a referral provision, that data are protected in accordance with the law. The Opinions of the Central Committee of the Communist Party of China and the State Council on Building Data Foundation Systems to Better Leverage the Role of Data as a Factor of Production (hereinafter the "Twenty Measures on Data") call for accelerating the construction of a data foundation system with Chinese characteristics and introduce a structural separation of the right to hold data resources, the right to process and use data, and the right to operate data products.

Scholarship on data intellectual property has concentrated largely on the subject matter eligible for registration, the examination and legal effects of registration, and the justification for a sui generis

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entitlement to data. Taken together, these debates indicate that the pivotal question is not whether a uniform proprietary title should be imposed on all data, but rather which processed outputs merit protection, what a registration certificate is capable of proving, and how the interests recognised through registration may subsequently enter circulation and attract remedies.

Zhejiang Province, one of the first pilot jurisdictions for data intellectual property reform in China, established a registration regime comparatively early, promulgating the Zhejiang Provincial Regulation on the Protection and Promotion of Intellectual Property and the Zhejiang Provincial Measures for the Registration of Data Intellectual Property (Trial) (hereinafter the "Registration Measures"). These instruments extend protection to data that have been lawfully collected, subjected to a degree of algorithmic or rule-based processing, endowed with practical value and characterised by intellectual achievement, and further provide that a registration document may serve as prima facie proof of the applicant's possession of the relevant data. Building on this provincial framework, Wenzhou has not treated registration as an isolated procedure. Responding instead to enterprises' reluctance, inability and unwillingness to share data, as well as to the difficulties of proof and remedy once disputes arise, the city has combined registration with compliance review, technical safeguards, transactional, financial and judicial mechanisms. The analytical significance of the Wenzhou experience therefore resides neither in the volume of registrations nor in the certificates themselves, but in the way a local government organises heterogeneous mechanisms into a continuous protection chain—and in whether that combination preserves the functional boundaries of each constituent institution.

# 2. INSTITUTIONAL FOUNDATIONS OF THE WENZHOU MECHANISM

## 2.1. The Zhejiang Reform as the Direct Legal Basis

Wenzhou's data intellectual property regime is anchored first in the provincial legal order. Zhejiang's local regulation and Registration Measures confine the protected object to data processed by algorithms or rules that possess practical value and the attributes of intellectual achievement, rather than to all unprocessed factual information. The pre- and post-registration procedures for evidence preservation, publication and opposition link a given data set to the applicant, the time of its formation and the rules governing its processing. This design responds to enterprises' need to protect their processing investment while precluding any reading of registration as a permanent monopoly over underlying data.

The Zhejiang reform also emphasises the exploitation and protection of registered data. Its experience, organised around "value creation and value realisation", combines theoretical groundwork with a systems approach, producing a pilot model in which registration, transactions, benefit allocation and rights protection operate in concert [1]. Wenzhou's institutional innovations have developed under the guidance of these provincial rules: taking the protected subject matter and the systematic-protection logic defined at provincial level as their point of departure, local rules further concretise the value of protecting enterprise data intellectual property.

## 2.2. Industrial Demand and the Shift towards Scenario-Based Protection

Wenzhou's manufacturing sector, specialised markets and private enterprises continuously generate data in the course of production, quality inspection, supply-chain management, marketing and customer service. Such data may not qualify as works under copyright law and, because they are shared to a limited extent, may not consistently satisfy the requirement that trade secrets remain non-public; nevertheless, sustained accumulation, cleaning, annotation and model-based analysis can confer substantial commercial value. Registration of data intellectual property thus offers firms a practical entry point for tracing data provenance, documenting processing steps and identifying marketable outputs.

The benchmark cases published by the Wenzhou authorities already span industrial manufacturing, sector-specific services, healthcare, intelligent transport, pledge financing and equity contributions. Among them, the "Credit Data Treasure" initiative connects the authorised operation of public data, data intellectual property registration and the recognition of data assets in financial statements [2]. These cases attest to the markedly application-oriented character of Wenzhou's mechanism for protecting commercial data intellectual property.

### 2.3. The Data Security Harbor as an Organisational Platform

China (Wenzhou) Data Security Harbor—the central organisational platform for the city's market-oriented reform of data as a factor of production—consolidates resources from data administration, market regulation, judicial and finance authorities, and incorporates a joint mechanism linking public security, procuratorial, court and justice-administration bodies. It provides end-to-end support running from data product development and security-compliance verification through property and intellectual property registration, asset valuation and balance-sheet recognition, to circulation and exchange. On this basis Wenzhou has brought together more than ten departments, including judicial, finance, market-regulation and data authorities, into a compliance service working group; established a three-stage compliance review mechanism of "enterprise self-examination, expert review and joint departmental review"; and advanced the joint processing of four certificates covering data intellectual property registration, data property rights registration, data asset registration and security-compliance review ("3+1" Coordinated One-Stop Processing Model), thereby coordinating registration, compliance, asset administration and transaction services. Complementing these arrangements, Wenzhou was the first jurisdiction in China to establish a "five-in-one" judicial safeguard system comprising a Data Resources Court, a Data Resources Procuratorial Office, a Data Resources Arbitration Institute, a Data Resources Notarisation Service Centre and a Data Security Protection Detachment, which collectively deliver litigation, arbitration, procuratorial, security and notarisation services.

## 3. THE OPERATIONAL STRUCTURE OF THE WENZHOU MECHANISM

### 3.1. Registration and Evidence Preservation: Identifying and Fixing the Protected Object

Wenzhou conducts data intellectual property registration through Zhejiang's unified provincial platform, identifying the object of protection by means of prior evidence preservation and the particulars entered in the register. The Registration Measures require that data submitted for registration first be preserved by notarisation or by trusted technical means, and that applicants submit materials concerning data provenance, structural scale, algorithmic rules and sample data. Grounded in the state of the data at a specified point in time, this arrangement establishes a verifiable correspondence between the applicant and a particular data set without requiring disclosure of the entire data content.

The normative function of registration is principally to furnish prima facie proof of the fact of possession, not to determine title conclusively. Formal examination, publication with opposition, and cancellation of registration together constitute mechanisms for verifying and correcting registered information. The value of registration therefore lies in reducing the cost of object identification and initial proof; it cannot substitute for a substantive assessment of data provenance, the scope of authorisation and competing rights and interests. The requirement that applicants submit corresponding evidence according to provenance also gives registration a secondary function of provenance mapping and compliance self-audit.

### 3.2. "3+1" Coordinated One-Stop Processing Model: Coordinating Procedures rather than Merging Effects

Alongside unified registration, Wenzhou has brought data property rights registration, data intellectual property registration, data asset registration and data security-compliance review within a coordinated procedure. A single application, information sharing and the reuse of materials reduce multiple filings and duplicative examination. Its institutional significance is that different procedures are organised around the same data product; it does not merge those registrations and reviews into a single comprehensive determination.

Although the four services may share the same factual materials, their examination purposes and the matters they certify must remain distinct. Data intellectual property registration primarily evidences the fact that the applicant holds the relevant data; data property rights registration addresses relationships of holding, use and operation; data asset registration serves asset administration; and security-compliance review evaluates the legal and technical risks of the processing activities in question. The joint scheme should therefore be understood as coordination of materials and procedures, not as a merger of conclusions and legal effects. Its operational boundary lies in category-specific examination and the separate issuance of certificates: the approval of one service cannot give rise to a presumption that the requirements of the others have been satisfied.

### 3.3. Compliance Review and Technical Safeguards: Risk Control in Data Circulation

Registration resolves the problem of object identification, but whether data may lawfully circulate depends on the compliance of their provenance and of the processing conduct. Wenzhou conducts data security-compliance review through a combination of enterprise self-examination, expert review and joint departmental review, and links review materials to the registration procedure. Its function is to convert dispersed provenance statements and risk information into verifiable materials, thereby lowering the information-acquisition costs borne by counterparties. In parallel with documentary review, Wenzhou explores technical safeguards for data circulation through infrastructures such as trusted data spaces. Trusted computing, access control and audit-trail logging operate respectively on data use, permission constraints and the traceability of conduct, rendering the processes of data control and use verifiable.

The two are functionally complementary rather than mutually substitutable. A compliance conclusion is bounded by the materials submitted, the data version and the applicable scenario, and does not constitute a continuing and comprehensive warranty of legality. Technical measures can constrain access and record use, but they neither create rights in data nor cure unlawful provenance. The core of the Wenzhou mechanism is thus the joint containment of risk through procedural verification and technical control, not the substitution of technical security for legal compliance.

### 3.4. Transactions and Financing: Market Credit

Wenzhou has introduced data intellectual property registration into licensing, trading, financing, insurance and equity-contribution scenarios. At the normative level, Article 12 of the draft Wenzhou Municipal Regulation on the Promotion of the Data Industry proposes to facilitate the use of data intellectual property in licensing, pledge, insurance, accounting and in-kind capital contributions, while Article 11 proposes that data rights registration certificates may serve as evidence for participation in data circulation and transactions, the recognition of data resources in accounts and financial statements, the certification of data-factor enterprises, and financing guarantees. Although the draft has not been formally enacted, it signals the city's intention to safeguard the interests of data rights holders and to promote the conversion and exploitation of data rights on the basis of a data rights registration system. At the level of pilot practice, Wenzhou's first batch of eleven publicly disclosed benchmark cases of data intellectual property includes instances of pledge financing, equity

contributions and listed trading. Among them, quality-inspection data held by Huahao Nonwoven Fabrics Co., Ltd. supported a credit-enhanced financing arrangement that secured a credit line of RMB 200 million. These practices indicate that registration materials can serve as a reference for market participants in identifying data outputs and assessing transactional risk.

The evidentiary function of registration, however, cannot be equated directly with market value or with the effectiveness of a security interest. The realisation of returns from data still depends on how the contract allocates scope of use, duration and liability, as well as on the data's application potential and on market demand. Financing likewise depends on corporate credit, cash flow and risk allocation. A credit line is not an actual disbursement, and disclosure of individual cases alone is insufficient to isolate the independent contribution of registration to financing decisions. The recognition of data resources in financial statements is governed by independent criteria: the relevant resource must, by reference to the purpose of holding and the substance of the business, satisfy the definition and recognition conditions for an intangible asset or inventory, and comply with the corresponding measurement, amortisation and disclosure rules. Registration can supply materials on the object and its provenance, but it cannot replace accounting recognition, still less produce an effect whereby "obtaining a certificate suffices for balance-sheet inclusion".

### 3.5. Specialised Adjudication and Plural Dispute Resolution: Closing the Remedial Loop

At the dispute-resolution stage, Wenzhou has made the Data Resources Court the centrepiece of a "three-in-one" adjudication model that hears criminal, civil and administrative cases together, and has introduced technical investigators, data analysts and other specialist expertise to strengthen the ascertainment of complex data-related facts. Coordination between the court and procuratorial, arbitration, notarial and public-security bodies supports evidence preservation, the channelling of disputes and the provision of remedies. Combining registration materials with access logs, data fingerprints and transaction records helps construct an evidential chain covering the formation, control and use of data.

Judicial protection must nonetheless distinguish evidentiary weight from substantive determination. At the evidentiary level, in a case concerning a data compilation, the Beijing Internet Court held that, following the entry into force of the amended statute, Article 13(3) of the Anti-Unfair Competition Law should apply, and accepted a data intellectual property registration certificate as prima facie evidence of the relevant data property interests and of the lawfulness of the data's source [3]. At the substantive level, Guiding Case No. 262 likewise recognised that a registration certificate may serve as prima facie evidence of data property interests and source legality, while rejecting the plaintiff's parallel claims to protect the same data through copyright and trade secret doctrines [4]. Registration therefore chiefly alleviates difficulties of proving the object and the fact of possession; the availability and scope of relief continue to depend on case-by-case scrutiny of the lawful interest asserted, the impugned conduct and the resulting harm.

## 4. INSTITUTIONAL FEATURES OF THE WENZHOU PATHWAY

### 4.1. From Standalone Registration to a Combination of Mechanisms

The Wenzhou pathway takes data intellectual property registration as its point of entry without equating registration with protection as a whole. Registration identifies the object; compliance review examines provenance and the boundaries of use; trusted technologies maintain actual control; contracts allocate transactional benefits; finance and insurance support value realisation; and judicial and arbitral bodies handle ex post disputes. Different instruments target different risks, yielding a polycentric protective structure rather than one dominated by a single right.

### 4.2. Limited Protection that Accommodates Circulation and Use

Registration renders processed data sets identifiable, tradable and provable, but it does not generate unlimited exclusivity. The grounds of protection derive principally from lawful provenance, processing investment, effective control, contractual stipulation and the impropriety of the defendant's conduct—not from the proposition that "whoever registers first monopolises the relevant data". This limited-protection structure resonates with the database model, which emphasises investment in the collection and structuring of data [5]., while preserving room for independent collection, lawful authorisation and legitimate use.

### 4.3. From Ex Post Remedies to Full-Lifecycle Governance

Enterprise self-examination, expert review and joint departmental review identify front-end risks; registration and evidence preservation fix intermediate states; trusted data spaces control the modality of delivery; contracts, insurance and financial mechanisms allocate transactional risk; and specialised adjudication provides the final remedy. Wenzhou thereby extends data intellectual property protection from the cessation of infringement and damages after an infringement occurs to the entire process of data formation, processing, circulation, use and exit.

### 4.4. Interaction between a City-Level Platform and Industrial Scenarios

The Data Security Harbor supplies common institutional, technical and legal services, while scenarios such as manufacturing, healthcare, intelligent transport and the authorised operation of public data test the operability of the rules. What is replicable in the Wenzhou experience is neither the number of certificates nor the physical form of an industrial park, but the combination of "a public service platform, industry application scenarios and enterprise compliance responsibility".

## 5. CURRENT LIMITATIONS AND PATHWAYS FOR REFINEMENT

### 5.1. Conflation of Certificates' Functions: Establishing a Statement of Legal Effects

While the joint processing of four certificates improves convenience, it may also lead enterprises, banks and counterparties to overestimate what the certificates establish. Each certificate should separately specify its legal basis, the scope of examination, its period of validity, the matters it proves, the matters it cannot prove and the authority responsible for it. A data intellectual property certificate should state expressly that it does not establish absolute ownership of underlying data, the permanent lawfulness of provenance or a determinate market value for the data. A compliance review must not be framed as an exemption from liability, and asset registration must not give rise to a presumption that the conditions for accounting recognition have been met.

A unified service window should verify only the completeness of shared materials, while the bodies issuing distinct conclusions should each bear their own responsibility. This preserves the efficiency gains from material reuse while preventing a review conclusion issued in one procedure from being cited directly in another in a manner that leaves responsibility unassigned.

### 5.2. Dynamically Changing Subject Matter: Strengthening Version Management

Continuously updated data sets may gradually diverge from the structure, scale and processing rules recorded at the time of registration. Wenzhou could establish a three-tier mechanism of "baseline registration, routine version filing and registration of material changes": ordinary increments would be recorded automatically through hashes, timestamps and logs; where data provenance, algorithmic logic, field structure, scope of authorisation or application scenario undergoes a material change, a fresh application for variation should be required and any necessary compliance re-review triggered;

and where an authorisation expires or provenance is confirmed to be unlawful, the registration should promptly be marked invalid or cancelled.

### 5.3. Ill-Defined Boundaries of Compliance Conclusions: Tiered and Time-Limited Review

Review intensity should be calibrated to the complexity of provenance, the degree of sensitivity, the scale of processing and the scope of circulation. For general enterprise operational data, the emphasis may fall on verifying submitted materials. Projects involving sensitive personal information, important data, healthcare data, the authorised operation of public data or large-scale scraping of publicly available data call for strengthened provenance verification and continuing supervision.

Where necessary, a compliance review opinion should state the data version, processing purpose, applicable subjects, technical environment, period of validity and limiting conditions, and should impose a duty to report material changes. Approval may serve only as evidence that the operator has discharged a certain duty of care; an enterprise that submits false information or processes data beyond the approved scenario remains liable under the law.

### 5.4. Insufficient Evidence of Value Realisation: Building Outcome Evaluation

The number of registrations, the volume of products listed, the scale of credit extended and the number of cases accepted largely measure institutional outputs; none of them, taken alone, demonstrates reduced financing costs, increased actual transactions or improved enforcement outcomes. Wenzhou should distinguish credit lines from disbursements and disclose interest rates, maturities, collateral arrangements and defaults; distinguish products listed from transactions concluded, and compile statistics on licensing completion rates, performance rates and repeat transactions; and, in the judicial domain, record the rate at which certificates are submitted, the manner of their admission, the matters they are taken to prove and their effect on the cost of proof and the duration of proceedings.

The evaluation framework should further incorporate adverse indicators such as opposition rates, variation and cancellation rates, time taken to correct errors, compliance re-review rates and security incidents. Only by disclosing processes, outputs and outcomes together can the real effectiveness of a full-chain mechanism be demonstrated.

### 5.5. Weak Articulation with the National Framework: Delimiting the Role of Local Services

Once a unified national system for data property rights registration is in place, Wenzhou's joint-processing scheme should concentrate on application guidance, preliminary material review, compliance review, trusted evidence preservation, transaction services and dispute resolution, rather than creating property certificates that compete with national registration. Information already examined under the national register—concerning the subject, the name of the data, provenance and restrictions on rights—may be reused in accordance with the law; the attributes specific to Zhejiang's data intellectual property registration, namely processing investment, practical value and intellectual achievement, should continue to be assessed independently under provincial procedures.

Where the same data appear on different platforms with inconsistent particulars as to subject, duration, type of right or use restrictions, mechanisms should be established for flagging conflicts, suspending downstream services, issuing notices and explanations, and referring disputes. National rules function here as the standard to which local mechanisms must connect, not as the central object of this article's analysis. The proper trajectory for the Wenzhou experience is to improve the quality of local services under a unified national registry, not to continue multiplying categories of certificate.

## 6. SUMMARY

The institutional value of Wenzhou's protection of data intellectual property lies not in creating a new form of data ownership through local registration, but in taking registration and evidence preservation as the point of entry and organising compliance review, technical control, market application and dispute resolution into an interconnected protective mechanism. This experience demonstrates that the protection of data rights and interests need not depend exclusively on a single exclusive entitlement: institutional support for investment in data and for its circulation can also be supplied through the identification of protected objects, proof of lawful interests, the configuration of boundaries of use and the regulation of improper conduct. The core of the Wenzhou experience is thus the functional complementarity of different protective instruments, not an increase in the number of registration certificates.

The effective operation of full-chain protection presupposes clearly demarcated functional boundaries at each link. The prima facie evidentiary effect of registration cannot replace the substantive determination of rights; procedural coordination does not entail a merger of certificates' legal effects; and neither compliance review nor technical control can constitute a comprehensive warranty of legality. Only by distinguishing factual proof, risk assessment, value judgement and judicial determination can facilitation measures be prevented from being misread as a comprehensive confirmation of title, limited protection be prevented from degenerating into undue exclusive control over data, and a balance be maintained between safeguarding lawful investment and preserving legitimate use.

Further refinement of the Wenzhou mechanism should shift emphasis from institutional creation to regulatory alignment and outcome verification. Within the framework of a unified national data property rights registration system, local government should, by reference to industrial scenarios and enterprise needs, improve the specification of certificates' legal effects, dynamic version management and tiered compliance review, and test institutional performance against actual transactions, access to finance and remedial outcomes. Its replicable value lies not in the straightforward transplantation of an industrial park or a certificate-issuance workflow, but in the capacity, developed under unified rules, to coordinate public services, market mechanisms and specialised remedies within local governance—so that data intellectual property protection genuinely serves the lawful development, orderly circulation and sustained use of data.

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