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# A Legal Framework for Data Intellectual Property Registration: Theoretical Basis and Practical Pathways

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**Abstract.** The existing paradigms of data intellectual property registration largely inherit from past practices in literary and industrial property rights, attempting to replicate the exclusive-control-oriented logic of information property rights through isomorphic mechanisms. However, as registration objects, data collections are characterized by instability and relative exclusivity, making them more suited to a framework of mutual benefit-sharing rather than exclusive control in terms of empowerment and rights confirmation. Consequently, the traditional paradigm of benefit-conferring registration is no longer sustainable. The non-benefit-conferring registration paradigm can address the shortcomings of the Anti-Unfair Competition Law in protecting data rights, balancing both passive defense and proactive utilization, and should be the pathway explored. In terms of systemic positioning, data intellectual property registration is a procedural adjunct rather than a substantive rule, and it must not overstep its bounds or suffer from an unclear nature due to low legal effectiveness hierarchy. In norms construction, it should be compatible with the various protective measures provided by the Anti-Unfair Competition Law, enhancing the certainty of protection and striving to dismantle information barriers in data elementalization allocation. Looking forward, it should maintain a harmonious resonance between substantive and procedural rules, fostering systematic new regulations for data intellectual property.

**Keywords.** Data Intellectual Property Registration; Data Property Rights; Data Elementalization; Anti-Unfair Competition Law

## 1. Introduction

Data is the driving force behind the digital economy. How to address the challenges of data empowerment and rights confirmation within the legal system to fully unleash the value of data elements is a subject worthy of research. Recently, responding to these questions within the intellectual property framework has gained significant policy support, becoming a practical exploration path. On September 22, 2021, the Central Committee of the Communist Party of China and the State Council issued the *Outline for Building an Intellectual Property Powerhouse (2021-2035)*, proposing the strategic goal of building an “intellectual property system oriented towards socialist modernization”, with the specific task of “researching and

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constructing data intellectual property protection rules” listed under it.<sup>[1]</sup> On October 28, 2021, the State Council issued the *14th Five-Year National Plan for Intellectual Property Protection and Application*, reaffirming the task mentioned above.<sup>[2]</sup> In December of the same year, the Strategic Planning Department of the National Intellectual Property Administration (CNIPA) held a meeting on data intellectual property protection work, aiming to implement the task of “researching and constructing data intellectual property protection rules” as outlined in the *14th Five-Year National Plan for Intellectual Property Protection and Application*, clarifying the division of tasks for supporting data intellectual property protection work.<sup>[3]</sup> Since then, multiple pilot projects on data intellectual property protection have been rolled out.

Data intellectual property registration is a representative achievement of the recent pilot projects. Under the coordination of the CNIPA, two batches totaling seventeen pilot regions have conducted beneficial explorations on data intellectual property registration and its supporting mechanisms. However, in contrast to the booming local practices, the theoretical logic of data intellectual property registration has not been sufficiently discussed in academic and industry circles, leading to a dilemma between the traditional paradigms of benefit-conferring and non-benefit-conferring registration, with significant path dependency characteristics. Different pilot regions still have divergences in the design of the registration system, and the legitimacy of the system at the normative level and its rationality at the empirical level remain subjects of scholarly inquiry. As a new round of data intellectual property pilot projects is in full swing, the necessity of analyzing and constructing the theoretical logic of data intellectual property registration becomes increasingly apparent: it not only helps the registration rules fully absorb the industrial needs and public interest considerations of data elementalization allocation, clarifying what data intellectual property registration should and can do, but also breaks the discrete status quo of the existing registration system, providing a “centripetal force” for the high-quality and efficient integration of pilot achievements.

## **2. Practical Examination of Data Intellectual Property Registration**

The advancement of data intellectual property registration has exhibited rapid momentum in China. According to disclosures by relevant officials from the Strategic Planning Department of the CNIPA, by the end of 2023, pilot regions for data intellectual property initiatives had issued over 5,000 data intellectual property registration certificates, with cumulative applications exceeding 11,000.<sup>[4]</sup> On May 24, 2024, the Strategic Planning Department of CNIPA publicly released the first batch of ten representative cases of data intellectual property registration, demonstrating the positive outcomes of registration in facilitating data rights confirmation and circulation.<sup>[5]</sup>

While the achievements of data intellectual property registration are commendable, the negative effects arising from ambiguities in theoretical logic accompanying the pilot projects must not be overlooked, as they threaten to hinder the long-term sustainability and successful conclusion of these initiatives. Specifically, in practice, significant disparities exist across pilot regions regarding the subjects, objects, procedures, durations, and legal effects of data intellectual property registration. Although regional variations in pilot schemes are inevitable and reflect the exploratory nature of iterative trial-and-error processes, divergences in the understanding and application of underlying theoretical logic have directly resulted in uncertainty regarding the legal validity of registration certificates. This uncertainty substantially undermines the intended objectives of data intellectual property registration—namely, supporting the production, circulation, and utilization of data elements—and must not

be allowed to proliferate unchecked alongside the issuance of certificates. In essence, if data intellectual property registration fails to provide registrants with relatively stable and predictable legal benefits or to ensure procedural order in the allocation of data elementalization, there will be a lack of objective incentives at the societal level for compliance with registration requirements, as the institutional benefits remain disproportionate to the implementation costs, thereby creating barriers to cultivating a market-oriented virtuous ecosystem of registration.

Table 1 Examples of the Objects of Data Intellectual Property Rights Registration

Pilot Regions	Registration Objects
Beijing	A data collection, collected by data holders or processors in accordance with laws, regulations, or agreements of contracts, processed through defined rules or algorithms, possessing commercial value and intellectual achievement attributes, and maintained in an undisclosed state. <sup>1</sup>
Shanghai	Data products such as processed data collections, processed data products, and data technology algorithms formed by natural persons, legal persons, or unincorporated organizations through substantive processing and innovative labor on their legally obtained data resources, which possess intellectual achievement attributes and commercial value. <sup>2</sup>
Jiangsu	Data that is legally obtained, processed through defined rules or algorithms, and possesses practical value and intellectual achievement attributes. <sup>3</sup>
Zhejiang	Data that is legally collected, processed through defined algorithms, and possesses practical value and intellectual achievement attribute. <sup>4</sup>
Fujian	/
Shandong	Data collection that is legally and compliantly obtained, processed through defined rules, and possesses practical value, intellectual achievement attributes, and a non-public nature. <sup>5</sup>
Guangdong	Data collection that is legally and compliantly obtained, processed through defined rules, and possesses commercial value. <sup>6</sup>
Tianjin	A non-public data collection that is collected by a data holder or data processor in compliance with legal regulations or agreements of agreements, processed through defined rules or algorithms, and possesses commercial value and intellectual achievement attributes. <sup>7</sup>
Hebei	A data collection that is collected in compliance with legal regulations, processed through defined algorithms (Non-full adoption of AI technology), and possesses practical value and intellectual achievement attributes. <sup>8</sup>
Shanxi	A data collection that is legally and compliantly obtained, processed through defined rules, and possesses practical value and intellectual achievement attributes. <sup>9</sup>
Anhui	A data collection that is legally and compliantly obtained, processed through

<sup>1</sup> See Article 2 of the Beijing Municipal Data Intellectual Property Registration Management Measures (Trial).

<sup>2</sup> See Article 3 of the Shanghai Interim Measures for Registration and Deposit of Intellectual Property Rights of Data Products.

<sup>3</sup> See Article 2 of the Jiangsu Province Data Intellectual Property Registration Measures (Trial).

<sup>4</sup> See Article 1 of the Zhejiang Province Data Intellectual Property Registration Management Measures (Trial).

<sup>5</sup> See Article 3 of the Shandong Province Data Intellectual Property Registration Management Rules (Trial).

<sup>6</sup> See Article 1 of the Guangdong Province Data Intellectual Property Registration Service Guide (Trial).

<sup>7</sup> See Article 6 of the Tianjin Municipal Shanxi Province Data Intellectual Property Registration Management Measures (Trial).

<sup>8</sup> See Article 1 of the Hebei Province Data Intellectual Property Registration Management Measures (Trial).

<sup>9</sup> See Article 2 of the Data Intellectual Property Registration Administration Measures.

	defined rules, and possesses practical value. <sup>10</sup>
Henan	Data that is legally and compliantly obtained, processed through defined rules, and possesses market value and intellectual achievement attributes. <sup>11</sup>
Hubei	A data collection that is legally and compliantly obtained, processed through specific algorithms or defined rules, possesses practical value and intellectual achievement attributes, and remains in a non-public state. <sup>12</sup>
Hunan	A data collection that is legally obtained, processed through defined rules, possesses intellectual achievement attributes and commercial value, and is accessible via electronic or other means for reading, identification, or access. <sup>13</sup>
Guizhou	A data collection that is legally and compliantly obtained, processed through defined rules, and possesses practical value and intellectual achievement attributes. <sup>14</sup>
Shaanxi	A data collection that is legally and compliantly obtained, processed through specific algorithms or defined rules, and possesses practical value and intellectual achievement attributes. <sup>15</sup>

Tracing back to the institutional origins, the design of data intellectual property registration largely replicates historical practices of intellectual property registration, exhibiting a hybrid character that grafts elements from both literary property rights (e.g., copyright) and industrial property rights (e.g., patents, trademarks), while lacking normative adaptations tailored to the unique attributes of its registration objects. On one hand, data intellectual property registration adheres to the principle of voluntariness, with registration certificates predominantly defined as prima facie evidence or endowed with prima facie probative capability,<sup>16</sup> thereby inheriting the functional logic of literary property registration aimed at clarifying rights ownership, mitigating the occurrence of disputes, and simplifying dispute resolution. On the other hand, constitutive elements of the registration objects—such as legality, derivativeness, practicality, and intellectual achievement—mirror the constitutive elements of industrial property rights, while procedural rules governing registration objections, renewals, and revocations replicate the legal effects associated with industrial property registration, rights acquisition, and enforcement. Simultaneously, the data intellectual property registration is actively assimilating successful experiences from judicial protection mechanisms and endeavoring to establish synergistic interfaces with them, with certain pilot regions stipulating that registration objects must possess non-publicity and commercial value, aligning with the preconditions for trade secret protection. However, the pilot initiatives exhibit pronounced path dependency, characterized by a lack of systematic interaction with substantive legal rules, and have consistently failed to establish a paradigm selection tailored to its own needs during the pilot work. Consequently, the feasibility and viability of data intellectual property registration remain unresolved, hindering its capacity to effectively support the market-based allocation of data elements. To bridge past practices with future directions, it is imperative to first clarify the operational rationale of traditional intellectual property registration as a reference framework, then holistically evaluate the necessity and feasibility of adapting it to the unique requirements of data empowerment and rights

<sup>10</sup> See Article 3 of the Anhui Province Data Intellectual Property Registration Measures (Trial).

<sup>11</sup> See Article 3 of the Henan Province Data Intellectual Property Registration Measures (Trial).

<sup>12</sup> See Article 3 of the Hubei Province Data Intellectual Property Registration Management Measures (Trial).

<sup>13</sup> See Article 2 of the Hunan Province Data Intellectual Property Registration Management Measures (Trial).

<sup>14</sup> See Article 2 of the Guizhou Province Data Intellectual Property Registration Management Measures (Trial).

<sup>15</sup> See Article 2 of the Shaanxi Province Data Intellectual Property Registration Management Measures (Trial).

<sup>16</sup> See the Beijing Intellectual Property Court's Civil Judgment 2024-Jing-73-Min-Zhong-546.

confirmation, thereby anchoring the normative trajectory for the evolution of data intellectual property registration.

### **3. Paradigm Choices in Data Intellectual Property Registration**

As a registration system designed to orderly guide the allocation of data elements—particularly their market-driven allocation—the institutional construction of data intellectual property registration must necessarily draw from the paradigms of traditional intellectual property registration (e.g., copyrights, patents, and trademarks) rather than attempting to start from scratch. In practice, the exploratory efforts of pilot regions largely follow this line of thinking. The intangible nature of data collections as registration objects appears to justify the grafting of old and new institutional frameworks.<sup>[6]</sup> Based on the legal effects triggered by registration, traditional intellectual property registration paradigms can be categorized into benefit-conferring registration and non-benefit-conferring registration. The former includes “substantive benefit-conferring registration”, which materially impacts the existence or completeness of rights over registered objects, such as China’s registration systems for trademarks, technical schemes, industrial designs, layout designs of integrated circuits, and plant varieties. It also encompasses “substantive-procedural benefit-conferring registration”, which grants evidentiary weight beyond the registration materials themselves, as seen in U.S. and South Korean copyright registration systems. The latter refers to registration types that neither substantively nor procedurally affect the acquisition or exercise of rights but with evidentiary preservation and fixation features that facilitate the realization of rights, such as copyright registration in China and Japan.<sup>[7]</sup> Overall, traditional intellectual property registration paradigms strictly adhere to the logic of exclusive-control-oriented property rights, aligning with the fixed and non-exclusive characteristics of registration objects. However, with the *Opinions of the CPC Central Committee and the State Council on Establishing a Data Base System to Maximize a Better Role of Data Elements* (hereafter “*Twenty Articles on Data*”) embedding the value of mutual benefit-sharing into the schema of “Separation of Three Rights” for data property rights, the simplistic replication of traditional paradigms in data intellectual property registration faces adaptive challenges in complying with regulations and achieving intended purposes.

#### **The Operational Logic of Traditional Intellectual Property Registration**

The emergence of property registration stems primarily from the increasing complexity of interest relationships in property due to the development of commodity economies.<sup>[8]</sup> *Res corporales*, as the earliest property, bore the brunt of this evolution. As commercial transactions became widespread and intricate, the right appearance of “possession that is all” faced a crisis of trust, and the likelihood of discrepancies arising between possession and ownership gradually increased. Consequently, the original purpose of property registration—whether static (rights confirmation) or dynamic (transactional)—was to bridge the informational gap between possession and ownership, ensuring certainty and stability in the use and transfer of property, thereby enhancing the efficiency of commodity economies.

Substantive benefit-conferring registration emerged as the procedural mechanism to achieve these goals. Through registration effectiveness and registration confrontation models, legislators tailored legitimacy standards for property transactions. The intrinsic linkage between registration and the perfection of rights, coupled with the publicity and credibility of registered information that ensures verification accessibility for the general public, constitutes the fundamental rationale underlying the successful implementation and achievement of

anticipated outcomes in registration systems. Fundamentally, the informational gap arose from the exclusivity of tangible property compounded by complex usage and transactional scenarios. As the situation of “possession that is not all” became pervasive, threatening the stability of commercial order, market demands catalyzed the evolution of property registration as the ultimate replacement for traditional transactional forms.<sup>[9]</sup>

Shifting the focus to intangible information—such as works, technical schemes, industrial designs, and trademarks—as newly recognized property objects reveal an extension of the substantive benefit-conferring logic of property registration, now encompassing empowerment and rights confirmation functions.<sup>[10]</sup> On one hand, unlike tangible property, the ownership and utilization status of information cannot be inferred from the possession of its physical carriers.<sup>[11]</sup> Rights holders cannot control their intellectual creations as effectively as they manage physical assets.<sup>[12]</sup> Certainly, in eras when science and technology remained underdeveloped, the uniqueness and specificity of primitive information carriers could establish correspondence between information creators and their outputs. This essentially meant that whoever generated information maintained primary control over it. However, information at that time lacked sufficient conditions for commercialization (being incapable of mass production, replication, or distribution). Consequently, discussions about registration as a transaction mechanism naturally found no practical foundation at that time. The “possession that is all” paradigm inherently clashed with the non-exclusive nature of information. Faced with growing demands for information commodification and the practical challenges of implementation, The fixed determination of ownership over registered objects in property rights registration, along with the functional aspects of their utilization in practice, aligns with the inherent laws governing the production and circulation of information, thereby addressing the growing demand for information commodification and its associated implementation challenges. It thus became a tool to artificially impose exclusivity on information, integrating it into exclusion-control-oriented property regimes.

On the other hand, the highly uncertain effectiveness boundaries of informational property rights necessitated registration to clarify their scope. Due to the intangible nature of informational objects and the technical complexities of rights interpretation, determining what constitutes protectable objects and the extent of protection has long posed challenges. Property registration systems stabilized the volatile status of works, technical schemes, design patents, and trademarks by fixing them into permanent or temporally sustained states linked to specific rights holders, thereby laying the groundwork for legally enforceable exclusive control. Traditional intellectual property registration thus emerged to confirm and confer exclusive property rights. While it could not fully resolve ambiguities in defining the scope of protection, it anchored methodologies such as the idea-expression dichotomy (copyright), patent document interpretation (patents), and likelihood of confusion doctrine (trademarks) to specific temporal and spatial contexts. Historical evidence shows that the practices of information empowerment and rights confirmation are inextricably linked with the involvement of the copyright registration system, with the two complementing each other. This dynamic has been a constant throughout the evolution from franchise rights to private rights.<sup>[13]</sup>

Substantive rules governing the acquisition and exercise of intellectual property rights serve as the blueprint for procedural rules. As the *Berne Convention*'s principle of automatic protection spread globally,<sup>17</sup> formalities for copyright acquisition and utilization

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<sup>17</sup> See *Berne Convention for the Protection of Literary and Artistic Works*, art.5(2)(1967).

diminished, at least for nationals of contracting states. Jurisdictions retaining substantive benefit-conferring copyright registration evolved procedural benefit-conferring rules, where registration confers an additional presumption of validity to the matters recorded in the certificate, thereby placing the registrant in a favorable position in the realization of their rights. For instance, the *U.S. Copyright Law* stipulates that, “In any judicial proceedings the certificate of a registration made before or within five years after first publication of the work shall constitute prima facie evidence of the validity of the copyright and of the facts stated in the certificate. The evidentiary weight to be accorded the certificate of a registration made thereafter shall be within the discretion of the court.”<sup>18</sup> Under the *Korean Copyright Law*, “A subject who is legally registered under their real name as the author shall be presumed to be the author of the registered work.”<sup>19</sup> The date of creation or the date of first publication shall be presumed to be the date of creation or first publication as recorded in the registration. Conversely, jurisdictions without substantive benefit-conferring registration developed non-benefit-conferring models, aligning registration with auxiliary rights confirmation functions as a paradigm of copyright registration applicable at most to nationals of contracting states.

In summary, the three traditional intellectual property registration paradigms share a unified operational logic: establishing and maintaining the “specific subject–specific object–specific content” framework for informational property rights. The fixability and non-exclusivity of registration objects enable the integration of object characteristics, legislative intent, and institutional design, achieving the goal of confirming and conferring exclusive rights over specific informational types.

### **Qualitative Differences in Data Collections as Registration Objects**

Whether adopting benefit-conferring or non-benefit-conferring registration, both traditional paradigms adhere to the logic of exclusion-control-oriented information property rights. However, data collections—as objects of data intellectual property registration—exhibit fundamental qualitative differences from works, technical schemes, design patents, and trademarks, leading to systemic incompatibilities when replicating traditional frameworks. These challenges manifest as follows:

First, data collections inherently exist in an unstable state, making it impossible to fix them into the stable forms required to construct exclusive property rights through registration. In essence, data collections inherently exist in a dynamic state, making it impossible for them to persist over time in a stable form or to establish the relatively stable correspondence between subjects (registrants) and objects (registered entities) as in traditional intellectual property registration. In contrast, once works, technical schemes, design patents, trademarks or their associated goods/services are registered, both the registered objects and their descriptive information can be fixed into a relatively stable state. This ensures consistency between the object at the time of registration and the object when asserting rights. However, constrained by the inherent fluidity and mutability of data collections, data intellectual property registration can only fix the registration subject and the information describing the object of registration, such as the name, description, sample data, industry classification, processing rules, application scenarios, and update frequency, while failing to encapsulate the registration object itself into a relatively stable state. When utilized, discrepancies between the registered object and the object for which rights are asserted may directly sever the

<sup>18</sup> See U.S. Copyright law, 17 U. S. C. § 410 (c)(2022).

<sup>19</sup> See Article 53 of Korean Copyright Law.

foundational efficacy of the registration certificate, rendering the intended objectives of registration unattainable.

Similar challenges have emerged in China's software copyright registration practices. As an object of copyright registration, computer software is unique in its continuous version updates and iterations, rendering it inherently unstable—a trait shared with data collections. While copyright registration for software can fix the correspondence between the registrant and identification materials at the specific temporal-spatial context of the registration application, creating transient or temporarily sustained representational stability, the registration subject's ongoing development of the software inevitably leads to a mismatch between the registered object and the object for which rights are asserted. This mismatch undermines the probative efficacy of registration certificates when invoked. For instance, in certain cases, courts of jurisdiction have examined software version iterations, integrating factors such as notarization, source code submissions, and development patterns, ultimately affirming the plaintiff's standing as a rights holder even when registration certificates were not promptly updated.<sup>20</sup> In another case, a plaintiff successfully synchronized critical version updates with registration renewals, thereby eliminating obstacles to leveraging the certificate as evidence of standing.<sup>21</sup> Conversely, plaintiffs asserting rights over software versions inconsistent with the registered version faced weakened enforcement outcomes.<sup>22</sup>

Second, while data collections are non-exclusive, their controllers and processors can easily achieve beneficial segregation through technical measures, eliminating absolute path dependency on establishing exclusion-oriented information property rights. In the book *Big Data: A Revolution That Will Transform How We Live, Work, and Think*, Viktor Mayer-Schönberger and Kenneth Cukier summarize the primary paradigm shift triggered by big data as “using all data, not just samples”, vividly illustrating the transition from the “small data era” to the “big data era” in realizing the value of data collections: large-scale utilization replaces fragmented usage, with the former significantly increasing the difficulty of parallel usage compared to the latter.<sup>[14]</sup> In essence, fragmented informational objects—such as works, technical schemes, design patents, and trademarks—typically realize their value through public distribution, where access, acquisition, and dissemination face minimal barriers, making it difficult for creators to exercise autonomous control. Placing such objects in the public domain risks underproduction of high-quality information due to inadequate incentives, potentially triggering a Tragedy of the Commons. This justifies the normative foundation for exclusion-control-oriented information property rights.<sup>[15]</sup> In contrast, even if large-scale, context-specific data collections are placed in the public domain, third parties (excluding controllers and processors) face high practical barriers to direct acquisition and utilization. While parallel usage based on non-exclusivity is theoretically feasible, it remains constrained by controllers' technical measures, specific usage scales/scenarios, and the behaviorist protections for data interests under the *Anti-Unfair Competition Law*. Thus, the non-exclusivity of data collections is relative: controllers' governance over their utilization mirrors the control principles of *res corporales*, enabling data collections to spontaneously form data element allocation order without mechanically replicating the fragmented information paradigms of the “small data era” through newly created property rights.

<sup>20</sup> See the Supreme People's Court of P.R.C.'s civil judgement 2021-SPC-Zhi-Min-Zhong-667.

<sup>21</sup> See the Supreme People's Court of P.R.C.'s civil judgement 2020-SPC-Zhi-Min-Zhong-1639.

<sup>22</sup> See the Supreme People's Court of P.R.C.'s civil judgement 2020-SPC-Zhi-Min-Zhong-1099.

The obstacle to data property registration lies not in the absence of statutory foundations for data rights, but in data's inherent morphological and value instability, which precludes its integration into traditional property registration systems.<sup>[16]</sup> The instability and relative non-exclusivity of data collections negate the necessity and feasibility of directly transplanting traditional intellectual property paradigms, necessitating a paradigm overhaul to eliminate path dependency.

### **Paradigm Restructuring to Balance Passive Defence and Proactive Utilization**

The intellectual property protection of data originated from judicial cases applying the general principles clauses, trade secret clauses, and internet-specific clauses of the *Anti-Unfair Competition Law*. This approach exhibits distinct behaviorist characteristics, markedly de-emphasizing adherence to exclusion-control-oriented property rights doctrines while aligning with the mutual benefit-sharing values articulated in the *Twenty Articles on Data*. As the sole substantive legal basis for current data intellectual property registration, the *Anti-Unfair Competition Law* safeguards data interests rather than data rights, leaving no normative foundation for the intervention of traditional benefit-conferring registration paradigms. Non-benefit-conferring registration, functioning as a process of evidentiary preservation and fixation, serves to assist rights confirmation and thereby unlock critical pathways for commercial operations. This paradigm does not conflict with existing data intellectual protection mechanisms but differs in its definition of "benefits". Therefore, adopting non-benefit-conferring registration as a blueprint to systematically address the deficiencies exposed in data intellectual property protection represents a viable approach for constructing normative frameworks for data intellectual property registration.

Concretely, the objectives are twofold: first, to substantially reduce the uncertainty in judicial protection of data intellectual property, and second, to effectively facilitate the market-driven allocation of data elements. Although judicial practices in data intellectual property protection have achieved notable results<sup>[17]</sup> and garnered recognition from scholars domestically and internationally,<sup>[18]</sup> critiques regarding their passivity, lagging effects, inability to ensure predictable protection of interests, and failure to proactively harmonize the proactive processes of data element allocation remain compelling. For instance, Professor Wu Handong argues that the data secret protection model (Article 9) can only provide "limited protection" for confidential data within big data, it constitutes a "defensive protection" fundamentally based on self-help confidentiality measures. Similarly, the data competition regulation model (Articles 2 and 12) can only provide passive and defensive protection, offering case-by-case, post-hoc safeguards for specific legal interests through judicial discretion, with such protections being applied retrospectively. Both models fall short of meeting the institutional demands for data property empowerment.<sup>[19]</sup> Professor Zhang Xinbao further contends that the non-rights-confirmation-based protection model under the *Anti-Unfair Competition Law* fails to delineate clear legal boundaries for data circulation and utilization, thereby dampening public enthusiasm for collaborative data development.<sup>[20]</sup> These deficiencies reflect the reality that the "old wine in new bottles" approach of judicial interpretation serves merely as a stopgap measure rather than an optimal solution. While data intellectual property registration, as a procedural mechanism, cannot directly override substantive law, it can recalibrate the balance between passive defence and proactive utilization, fostering the value generation of data elements through mutual benefit-sharing. This aligns precisely with the functional intent of the non-benefit-conferring registration paradigm.

#### **4. Exploring Pathways for Data Intellectual Property Registration**

Currently, the “divide-and-conquer” approach to data intellectual property registration represents a provisional state rather than an institutionalized norm. Building consensus, exploring viable pathways, and gradually achieving harmonization and integration of registration rules constitute the future orientation of pilot initiatives. To this end, it is imperative to first clarify the systemic positioning of data intellectual property registration, then delineate immediate plans for normative adjustments, and finally forecast the normative trajectory of data intellectual property protection.

##### **Systemic Positioning: A Procedural Adjunct, Not a Substantive Rule**

The systemic positioning of data intellectual property registration serves as a critical theoretical pillar for anchoring the system’s normative trajectory. Its essence lies in accurately defining the role and functions that data intellectual property registration should play within the broader data intellectual property protection framework, thereby resolving the current discrete status quo of divergent institutional designs across pilot regions and fully unleashing the system’s intended efficacy. On one hand, it is necessary to clarify the interactive relationship between data intellectual property registration and substantive intellectual property rules to avoid transgressing procedural limits. On the other hand, the hierarchical positioning of data intellectual property registration must be determined to ensure its operational effectiveness.

Data intellectual property registration is established on the foundation of substantive rules and possesses a subordinate nature, functioning as a procedural adjunct to enhance the operation of substantive rules. In essence, the substantive rules governing data intellectual property protection are primary, while data intellectual property registration, as a procedural mechanism, is secondary. The latter should neither transcend the former to carve out novel dimensions of data intellectual property protection nor restrict the existing scope of such protection. A review of the data intellectual property registration rules established across pilot regions reveals that most frameworks explicitly cite substantive laws—such as the *Civil Code*, *Cybersecurity Law*, *Data Security Law*, *Personal Information Protection Law*, and *Anti-Unfair Competition Law*—as their foundational basis. This demonstrates an acknowledgment of registration’s subordinate relationship to substantive and ancillary rules. However, this principle has not been consistently implemented in the practical design of registration systems. For example, registration schemes in Beijing, Shandong, Tianjin, and Hubei uniformly require that data collections, as registration objects, remain in a non-public state,<sup>23</sup> aligning solely with the trade secret protection pathway for data interests while neglecting judicial recognition of protections for publicly available data.<sup>24</sup> Some scholars attribute this approach to registration rules’ attempt to establish conceptual links between data and intellectual property,<sup>[21]</sup> a rationale with partial validity that also aligns with most pilot regions’ emphasis on the intellectual achievement requirement for data collections.<sup>[22]</sup> These observations highlight the inadequate cohesion and interaction between substantive and procedural rules in data intellectual property governance. Procedural rules currently fail to fully align with or

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<sup>23</sup> See Article 2 of the Beijing Municipal Data Intellectual Property Registration Management Measures (Trial), Article 3 of the Shandong Province Data Intellectual Property Registration Management Rules (Trial), Article 6 of the Tianjin Municipal Data Intellectual Property Registration Measures (Trial), and Article 3 of the Hubei Province Data Intellectual Property Registration Management Measures (Trial).

<sup>24</sup> See the Shanghai Intellectual Property Court’s Civil Judgment 2016-Hu-73-Min-Zhong-242.

accommodate the holistic scope of substantive rules, occasionally even overstepping their bounds. Targeted adjustments are therefore imperative.

Simultaneously, the hierarchical efficacy of data intellectual property registration should be progressively elevated to align with statutory laws and administrative regulations, ensuring its determinacy and stability to effectively facilitate the elemental allocation of data. To date, data intellectual property registration rules are dispersed across normative documents issued by pilot regions. Their low legal effectiveness hierarchy precludes clear stipulations on the legal effects of registration and risks fostering societal misperceptions of its validity. In essence, intellectual property registration is typically linked to rights acquisition, exercise, or at least auxiliary rights exercise. This is achieved either through integrated substantive-procedural frameworks (e.g., the *Patent Law* and *Trademark Law*) or via bifurcated systems separating substantive and procedural rules (e.g., the *Copyright Law* alongside the *Trial Measures for the Voluntary Registration of Works* and *Measures for the Registration of Computer Software Copyrights*). Regardless of form, the ability of registration to provide certain and stable expected benefits constitutes the market-driven incentive for public participation, and the legal effectiveness hierarchy of laws and administrative regulations is a prerequisite for achieving this while eliminating ambiguity. However, in the absence of substantive rules specifying formal or procedural requirements for data intellectual property protection, registration rules—existing as normative documents—operate in a gray area between rights empowerment, rights confirmation, and evidentiary preservation, generating negative externalities.<sup>25</sup> Consequently, societal recognition akin to traditional intellectual property registration may falter, and the necessity of data intellectual property registration itself risks being questioned. In practice, media narratives occasionally hype the link between registration and the acquisition of exclusive control rights,<sup>[23]</sup> fostering inflated societal expectations and sowing systemic risks. If registrants cannot realize their anticipated benefits through certificates in dispute resolution, the resultant credibility erosion of the registration system would be incalculable.

### **Norms Construction: Addressing Deficiencies, Not Building Anew**

The Anti-Unfair Competition Law, as the substantive foundation for data intellectual property registration, emphasizes passive defense on the frontend and inherently lacks the capacity to inject a dynamic impetus into the backend of data elementalization allocation. While data intellectual property registration cannot transcend substantive rules, it can enhance the certainty of data intellectual property protection through centralized management of evidentiary materials and dismantle information barriers in data allocation via the disclosure of registration-related metadata, all while maintaining precise alignment and compatibility with substantive rules. This approach strives to remedy the practical shortcomings of existing substantive rules.

First, select the non-benefit-conferring paradigm to alleviate registration subjects' evidentiary burdens in judicial protection through evidentiary preservation and fixation, while

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<sup>25</sup> For instance, Article 2 of the Shanxi Province Data Intellectual Property Registration Management Measures (Trial) stipulates: "Data processors own lawful rights and interests, including possession, use, commercialization, and profit-making, over data collections that have undergone data intellectual property registration." Based on this provision, it appears that only entities completing registration may enjoy such rights over the corresponding data collections, with legal safeguards. However, the behaviorist protections for data interests under the Anti-Unfair Competition Law impose no formal or procedural requirements. Even if registration certificates are invoked judicially, they lack presumptive validity or substantive benefit-conferring effects.

imposing reasonable review obligations on registration authorities and their delegated agencies. Traditional benefit-conferring registration paradigms, deeply intertwined with exclusion-control-oriented empowerment and rights confirmation, require substantive rules to explicitly define requirements of form and formality for intellectual property protection—a framework incompatible with current data intellectual property rules. Thus, defining data intellectual property registration as a confirmation of data property interest ownership with probative functions<sup>[24]</sup> is reasonable. However, the extent of this probative capacity depends on the design of registration criteria and review standards, necessitating a balance between institutional costs and benefits. This paper argues that data intellectual property registration should preserve evidence demonstrating feasible behavioral regulation, such as data samples, algorithmic processing rules, legally obtained certification reports, and confidentiality measures, fully aligning with the *Anti-Unfair Competition Law*'s behaviorist protections for data interests.<sup>26</sup> Registrations need not require non-public status for data collections. Registration authorities need only conduct verification within the scope of capability, avoiding excessive scrutiny. When invoked, as solitary evidence, registration certificates may act as prima facie evidence to shift the burden of proof. Opposing parties may rebut with counterevidence, while registrants gain relatively certain and stable procedural advantages in dispute resolution.

Second, address data element allocation demands by filing and disclosing descriptive information to dismantle Data Silos and foster orderly markets. The substantive and procedural rules of data intellectual property must balance passive defence (e.g., structured and orderly dispute resolution) and proactive utilization (e.g., dispute prevention and transactional efficiency improvement). Currently, the *Anti-Unfair Competition Law*'s behaviorist protections overemphasize the former while neglecting the latter: On the one hand, external parties struggle to assess data protection status, hindering self-regulation and inducing a Chilling Effect; On the other hand, defensive measures fail to actively bridge data controllers, processors and potential demander. To address this, beyond the function of preserving evidence materials, data intellectual property registration should record registration objects' industry, application scenarios, structural scale, update frequency, and provide public access channels. The above content can be filled in by the registration subjects and then filed without the involvement of the registration authority and its entrusted institutions in the review. While unrelated to behaviorist protections of data interests under the *Anti-Unfair Competition Law*, this approach eliminates information barriers, expands on/off-market transactions, and enhances market-based allocation of data elements.

The divergences in pilot data intellectual property registration schemes—regarding subjects, objects, procedures, durations, and legal effects—stem from poor interaction between registration and substantive data protection rules, leading to the misguided adoption of incompatible benefit-conferring registration paradigms. Defining data intellectual property

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<sup>26</sup> When defining the protected objects of data intellectual property, Shen Changyu, Commissioner of the National Intellectual Property Administration, emphasized alignment with a behaviorist regulatory approach, requiring objects to meet criteria of legality (lawful acquisition), derivativeness (processed under defined rules), and practical applicability (functional value). Similarly, while the Beijing Municipal Data Intellectual Property Registration Management Measures (Trial) initially required registration objects to remain non-public, the subsequent Beijing Municipal Guidelines for Enterprise Data Intellectual Property Management (Trial)—jointly issued by the Beijing Municipal Intellectual Property Office, Beijing Municipal Bureau of Economy and Information Technology, and People's Procuratorate of Beijing Municipal—diverged from this requirement, reflecting a deliberate shift toward behaviorist regulatory alignment.

registration as non-benefit-conferring evidentiary preservation and fixation can resolve current divergences. This approach fully aligns with the *Anti-Unfair Competition Law*'s existing protections for data interests while establishing a communication bridge between data suppliers and demanders, thereby preventing pilot programs from becoming self-limiting.

### **Future Prospects: Developing Systematic Data Intellectual Property Rules**

Looking ahead, owing to behavioral regulation's weakening of the exclusive-control-orientation, data intellectual property registration could evolve from a non-benefit-conferring evidentiary mechanism into a procedural tool for data empowerment and rights confirmation, serving as the starting point for China's "Separation of Three Rights" for data governance. The dual structure of substantive norms (primary) and procedural norms (secondary) constitutes the customary model of intellectual property legislation. Protecting rights through the regulation of conduct serves as the manifestation of intellectual property's functional capabilities. The *Anti-Unfair Competition Law* safeguards both specific rights and general interests, while exhibiting an "incubative nature" that preemptively protects emerging yet undefined rights.<sup>[25]</sup> Data intellectual property registration synergizes with the *Anti-Unfair Competition Law*'s behaviorist approach, sharing this incubative function. It is essential to enhance the certainty and stability of data collections being protected under the *Anti-Unfair Competition Law*, and then build upon the practical achievements already made in judicial protection, thereby laying a solid foundation for exploring systematic rules on data empowerment and rights confirmation. Divergences between existing legislation, judicial practice, and registration rules require adaptive adjustments to fully realize this incubative role. Ultimately, registration should integrate into data intellectual property norms as a dynamic component—akin to copyright registration for copyright substantive norms, patent grants for patent substantive norms, or trademark registration for trademark substantive norms—rather than existing independently. At present, it has become a trend to steadily surpass the existing achievements of judicial protection of data intellectual property rights. The latest revision of the *Anti-Unfair Competition Law* also shows the intention to expand the substantive provisions of data intellectual property protection.<sup>[26]</sup> Registration systems must align with legislative and practical advancements to solidify China's approach to data intellectual property governance.

### **5. Conclusion**

The *Twenty Articles on Data* propose exploring "new methods for data property registration", aiming to establish a structural rights allocation system and develop a data property regime with Chinese characteristics.<sup>[27]</sup> Current data intellectual property registration practices, modeled on traditional benefit-conferring and non-benefit-conferring paradigms, rely on exclusion-control-oriented property rights logic. These frameworks clash with the instability and relative non-exclusivity of data collections as registration objects, and misalign with the *Anti-Unfair Competition Law*'s focus on protecting data interests rather than data rights. Consequently, mechanically replicating benefit-conferring paradigms is unsustainable.

Non-benefit-conferring registration, which preserves evidence and smooth transaction information, aligns with existing data intellectual property protection mechanisms while addressing the limitations of the *Anti-Unfair Competition Law*'s overreliance on data interests protection, which overly emphasizes passive defense over proactive utilization. It should serve as an interim measure to guide pilot regions in addressing the discrete status quo. Specifically, first, clarify that data intellectual property registration functions as a procedural

adjunct rather than a substantive rule, while ensuring it possesses sufficient legal authority to eliminate ambiguities. Second, define that data intellectual property registration should remedy existing deficiencies in the current framework rather than create parallel systems, thereby enhancing certainty in data intellectual property protection while dismantling information barriers between supply and demand in data resource allocation. Finally, maintain real-time alignment of data intellectual property registration with legislative and practical developments, laying the groundwork for formulating systematic data intellectual property protection rules.

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