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Reconceptualizing Data Ownership in the Digital Economy: Challenges for Intellectual Property Law

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ABSTRACT: This paper reconceptualizes data ownership by examining the limitations of conventional IP regimes—such as copyright, patents, and trade secrets—in addressing the complex, dynamic nature of data generation and use. It explores emerging legal and policy approaches, including data governance models, user rights frameworks, and regulatory interventions like data protection laws and data-sharing mandates. The study highlights tensions between innovation, competition, privacy, and economic value extraction, arguing for a more flexible, hybrid legal approach that balances stakeholder interests. Ultimately, the paper proposes a shift from strict ownership paradigms toward stewardship, access rights, and accountability mechanisms as more viable frameworks for governing data in the digital age.

KEYWORDS: Data ownership, digital economy, intellectual property law, data governance, privacy, data rights, innovation policy, platform economy, data protection, legal reform

I. INTRODUCTION

The rapid expansion of the digital economy has fundamentally transformed the nature, value, and control of data, prompting a critical reassessment of traditional legal frameworks. Data is no longer merely a by-product of economic activity; it has become a central asset driving innovation, competition, and governance across industries. From social media interactions and e-commerce transactions to artificial intelligence (AI) training datasets and Internet of Things (IoT) ecosystems, vast quantities of data are continuously generated, collected, and monetized. In this evolving landscape, the question of who owns data—and under what legal conditions—has emerged as a complex and contested issue. Intellectual Property (IP) law, historically designed to protect tangible expressions of creativity and invention, now faces significant challenges in addressing the unique characteristics of data in the digital age.

Traditional IP regimes, including copyright, patents, and trade secrets, are grounded in principles of originality, inventiveness, and confidentiality. However, raw data often lacks the creativity required for copyright protection, may not meet the technical thresholds for patentability, and is frequently shared or aggregated in ways that undermine trade secret claims. As a result, data frequently exists in a legal gray area, where its economic value is undeniable but its ownership remains ambiguous. This ambiguity is further complicated by the non-rivalrous and replicable nature of data: unlike physical property, data can be copied and used simultaneously by multiple actors without depletion, challenging conventional notions of exclusivity and control.

Moreover, the digital economy is characterized by asymmetries in data collection and access. Large technology companies often accumulate vast datasets through user interactions, creating significant market power and raising concerns about competition, privacy, and fairness. Individuals, whose personal data fuels many digital services, typically lack meaningful control or ownership rights over their information. This imbalance has led to growing calls for a reconceptualization of data ownership that better reflects the interests of multiple stakeholders, including users, firms, and society at large.



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At the same time, regulatory developments such as data protection laws and data governance frameworks are beginning to intersect with IP law, further complicating the legal landscape. Instruments like the General Data Protection Regulation (GDPR) emphasize user rights and control over personal data, while emerging policies on data sharing and open data seek to promote innovation and public benefit. These overlapping regimes highlight the limitations of relying solely on traditional IP concepts to govern data and underscore the need for a more nuanced and flexible approach.

This paper argues that reconceptualizing data ownership requires moving beyond the rigid boundaries of conventional IP law toward a hybrid framework that integrates elements of property, contract, and regulatory governance. Such a framework must account for the distinctive features of data, including its relational nature, economic significance, and societal implications. By examining the challenges posed by the digital economy, this study aims to contribute to the ongoing debate on how legal systems can adapt to ensure both the protection and equitable use of data in an increasingly data-driven world.

II. NATURE OF DATA IN THE DIGITAL ECONOMY

Unlike traditional forms of property, data is intangible, easily replicable, and often generated through the interactions of multiple parties. For example, a single dataset may involve contributions from users, platforms, algorithms, and third-party processors. This multi-origin nature complicates any straightforward claim of ownership. Furthermore, data is non-rivalrous—its use by one party does not diminish its availability to others—which challenges the exclusivity principle that underpins most IP rights.

Data also varies significantly in form and value. Personal data, industrial data, and aggregated datasets each raise different legal and ethical concerns. Personal data is closely tied to individual privacy and autonomy, while industrial data is often linked to trade secrets and competitive advantage. Aggregated or anonymized data, meanwhile, may have significant commercial value without being attributable to any single individual. These distinctions further complicate attempts to fit data within existing IP categories.

Limitations of Intellectual Property Law

Intellectual property law comprises several regimes—copyright, patents, trademarks, and trade secrets—each designed to protect specific types of intangible assets. However, none of these categories fully captures the nature of data.

1. Copyright Law

Copyright protects original expressions fixed in a tangible medium. While databases may receive protection if they involve sufficient creativity in selection or arrangement, *raw data* itself is typically not protected. Facts and information are considered part of the public domain.

This creates a paradox: while vast amounts of valuable data are generated daily, much of it falls outside the scope of copyright protection. Moreover, even when databases are protected, the protection is “thin” and does not extend to the underlying data.

2. Patent Law

Patents protect novel, non-obvious, and useful inventions. While algorithms and data processing methods may be patentable in certain jurisdictions, data itself is not. Furthermore, the high threshold for patentability and the requirement of disclosure make patents an imperfect tool for protecting data-driven innovations.

3. Trade Secrets

Trade secret law protects confidential business information that provides a competitive advantage. Companies often rely on this regime to protect proprietary datasets. However, trade secret protection is contingent on secrecy—once data is disclosed or leaked, protection is lost.

This creates tension in a digital environment where data sharing and collaboration are increasingly necessary for innovation.

4. Database Rights (EU Context)

The European Union introduced a *sui generis* database right to protect substantial investments in obtaining, verifying, or presenting data. While this offers some protection, it has been criticized for being overly broad and potentially stifling competition and innovation.



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Challenges in Applying IP Law to Data Ownership

The mismatch between data characteristics and IP frameworks gives rise to several challenges:

1. Lack of Clear Ownership Rights

IP law does not recognize a general right of ownership over data. This creates uncertainty for businesses and individuals regarding their rights and obligations. For instance, who owns the data generated by a wearable fitness tracker—the user, the device manufacturer, or the service provider?

2. Fragmentation of Rights

Data often involves multiple stakeholders, each with partial claims. Users may have privacy rights, platforms may have contractual rights, and companies may claim proprietary interests. This fragmentation complicates governance and enforcement.

3. Cross-Border Issues

Data flows across jurisdictions, each with different legal regimes. This creates conflicts of law and regulatory uncertainty. For example, the European Union's General Data Protection Regulation (GDPR) emphasizes user control over personal data, while other jurisdictions adopt more market-driven approaches.

4. Balancing Innovation and Access

Strong ownership rights may incentivize investment in data collection and analysis. However, they can also hinder innovation by restricting access. For example, exclusive control over large datasets can create barriers to entry for smaller firms and stifle competition.

5. Privacy and Ethical Concerns

Data ownership intersects with privacy rights. Personal data is not merely an economic asset but also a reflection of individual identity. Granting ownership rights over personal data raises ethical questions about commodification and consent.

Emerging Approaches to Data Ownership

Given these challenges, scholars and policymakers are exploring alternative approaches to data governance.

1. Data as a Commons

One approach conceptualizes data as a **shared resource**, similar to a commons. Under this model, data is accessible to multiple users under regulated conditions. Open data initiatives and data-sharing platforms exemplify this approach. However, managing a data commons requires robust governance mechanisms to prevent misuse and ensure equitable access.

2. Data Portability and User Rights

Regulations like the GDPR emphasize **data portability**, allowing individuals to access and transfer their data between service providers. This shifts the focus from ownership to **control and access rights**.

While this enhances user autonomy, it does not fully resolve questions of ownership or address non-personal data.

3. Contractual Frameworks

In practice, data rights are often governed by contracts, such as terms of service agreements. These agreements define how data can be used, shared, and monetized.

However, contractual approaches may be problematic due to power imbalances between users and large corporations, leading to concerns about fairness and transparency.

4. Data Trusts and Stewardship Models

Data trusts and stewardship models aim to manage data on behalf of stakeholders. A trustee or steward oversees data use, ensuring compliance with ethical and legal standards.

This approach emphasizes **responsibility over ownership**, aligning data governance with broader societal interests.

5. Sui Generis Data Rights

Some scholars advocate for the creation of a new, **sui generis** legal framework specifically for data. Such a regime could recognize unique characteristics of data and provide tailored rights and obligations.



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For example, a data right could grant limited control over data use without conferring full ownership, balancing incentives and access.

Challenges for Intellectual Property Law

The evolving nature of data raises several key challenges for IP law:

1. Defining the Subject Matter

IP law requires clearly defined subject matter. However, data is fluid, dynamic, and often lacks clear boundaries. Determining what constitutes a “dataset” or a protectable unit is inherently difficult.

2. Balancing Incentives and Access

IP law traditionally aims to balance incentives for innovation with public access. In the context of data, overly strong rights may stifle innovation by restricting access, while weak protection may discourage investment.

3. Addressing Power Imbalances

Large technology firms have significant advantages in collecting and exploiting data. IP law, as currently structured, may reinforce these imbalances rather than mitigate them.

4. Interoperability and Data Portability

Modern economies require data to flow across systems and borders. IP protections that restrict data sharing may hinder interoperability and competition.

5. Global Fragmentation

Data governance regimes vary widely across jurisdictions, leading to legal uncertainty and compliance challenges for multinational companies. Harmonizing these frameworks is a major challenge.

Toward a New Legal Paradigm

Reconceptualizing data ownership requires moving beyond traditional property-based frameworks. Several principles may guide the development of a new legal paradigm:

1. Functional Approach

Rather than focusing on ownership, laws should address specific functions such as access, use, control, and sharing. This allows for more flexible and context-specific regulation.

2. Differentiation of Data Types

Not all data is the same. Legal frameworks should distinguish between personal, non-personal, industrial, and public data, with tailored rules for each category.

3. Emphasis on Fairness and Equity

Ensuring that the benefits of data are distributed fairly is crucial. This may involve mechanisms for revenue sharing, transparency, and accountability.

4. Promotion of Innovation

Legal frameworks should facilitate data-driven innovation by encouraging responsible data sharing and reducing barriers to entry.

5. International Cooperation

Given the global nature of data flows, international collaboration is essential to create consistent and effective regulatory frameworks.

III. CONCLUSION

The rapid expansion of the digital economy has fundamentally disrupted traditional notions of data ownership, exposing the limitations of existing intellectual property (IP) frameworks. Data, unlike conventional forms of property, is non-rivalrous, easily replicable, and often co-created by multiple actors, making exclusive ownership claims difficult to justify and enforce. As a result, the attempt to fit data within rigid IP structures—such as copyright, patents, or trade secrets—frequently leads to conceptual inconsistencies and practical inefficiencies.

This reconceptualization highlights the need to move beyond ownership-centric models toward more flexible, context-sensitive approaches. Emphasis should shift toward governance mechanisms that prioritize access, control, and fair use rather than absolute ownership. Concepts such as data stewardship, shared rights, and user-centric control frameworks offer promising alternatives that better reflect the collaborative and dynamic nature of data generation in the digital environment.



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Moreover, the growing importance of data in driving innovation, competition, and economic value calls for a careful balancing of interests. Policymakers must reconcile the protection of investments and incentives for data-driven innovation with the need to ensure competition, privacy, and equitable access. Overly strong proprietary rights risk creating data monopolies, while insufficient protection may undermine incentives to collect and curate valuable datasets.

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