

# Intellectual Property Law in the Digital Economy Era: New Challenges and Countermeasures

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## ABSTRACT

With the rapid development of the digital economy, intellectual property protection faces new challenges such as the definition and protection of data rights, the legal status of AI-generated works, cross-border infringement, the responsibility of internet platforms, and the protection of trade secrets. This paper analyzes the characteristics of the digital economy era and the specific issues faced by intellectual property law, proposing corresponding countermeasures. These include improving the data rights protection system, clarifying the legal status of AI-generated works, strengthening international cooperation, defining the responsibilities of internet platforms, and enhancing the protection of trade secrets. Through the integration of law and technology, international cooperation, and public education, the paper aims to promote the innovation and development of the intellectual property protection system to facilitate the healthy growth of the digital economy.

## KEYWORDS

Digital economy; Intellectual property; Legal countermeasures

## 1. INTRODUCTION

With the rapid development of the digital economy, the global economy is undergoing a profound transformation. The rapid advancement and widespread application of digital technology have not only changed traditional economic models but also brought unprecedented legal challenges. Intellectual property (IP), as a crucial legal tool for protecting innovation and incentivizing creation, faces new challenges and opportunities in the digital economy era [1].

One of the most prominent features of the digital economy era is the emergence of data as a new type of production resource [2]. Data is not only the foundation for business decisions and market forecasts but also a driving force for technological innovation and business model transformation. Meanwhile, the speed of technological iteration has significantly accelerated, and the innovation cycle has greatly shortened. This requires the legal system to quickly adapt to technological changes to effectively protect intellectual property. Additionally, the characteristic of global interconnectedness blurs geographical boundaries, making cross-border cooperation and trade more convenient but also complicating cross-border IP protection [3]. The rise of the internet platform economy further disrupts traditional industrial structures, with new business models constantly emerging, posing new demands on IP protection.

In this context, the traditional IP legal system appears inadequate and requires corresponding adjustments and improvements. This paper will explore in detail the new challenges faced by IP law in the digital economy era, including the definition and protection of data rights, the legal status of AI-generated works, cross-border infringement issues, the responsibilities of internet platforms, and

the protection of trade secrets. It will also propose corresponding countermeasures to provide reference for legal practice and policy-making.

## **2. CHARACTERISTICS OF THE DIGITAL ECONOMY ERA**

The digital economy era is a stage of economic development driven primarily by digital technology. Its main characteristics are as follows:

### **2.1. Data as a New Production Resource**

Data plays an increasingly important role in the digital economy. As a new production factor, data is not just a collection of information; it is also the foundation for business decisions and market predictions [4]. By collecting, analyzing, and utilizing vast amounts of data, companies can more accurately understand market demands, optimize resource allocation, and enhance operational efficiency. For example, big data analysis can help companies achieve precision marketing and improve user experience, thereby enhancing market competitiveness.

### **2.2. Accelerated Technological Iteration**

The rapid pace of digital technology development has significantly shortened innovation cycles, driving rapid updates in technology and business models [5]. Emerging technologies such as artificial intelligence, blockchain, and the Internet of Things continually reshape traditional production methods and business models. The fast-paced technological iteration requires companies to constantly innovate to maintain a competitive edge. However, this also raises the bar for intellectual property protection, necessitating a legal system that can quickly adapt to and respond to technological changes, providing effective protection mechanisms.

### **2.3. Global Interconnectedness**

Digital technology breaks down geographical barriers, leading to closer global market connections and facilitating cross-border cooperation and trade [6]. The widespread use of the internet and global information networks allows companies to easily enter international markets and engage in cross-border operations and collaborations. This characteristic not only promotes global economic integration but also complicates intellectual property protection and cross-border infringement issues. Different countries have varying laws and standards for intellectual property protection, creating a pressing need for coordination and harmonization of IP protection on a global scale.

### **2.4. Rise of the Platform Economy**

Internet platform-based business models, such as e-commerce, social media, and the sharing economy, have dramatically transformed traditional industrial structures [7]. The platform economy connects supply and demand, achieving efficient resource allocation and sharing, and creating immense economic value. The rise of internet giants like Alibaba, Amazon, and Tencent exemplifies the development of the platform economy. However, the rapid growth of the platform economy also brings new challenges for intellectual property protection. Issues such as how to effectively prevent and combat infringement on platforms and how to define platform responsibilities need thorough exploration.

The digital economy era, characterized by data as a new production resource, accelerated technological iteration, global interconnectedness, and the rise of the platform economy, poses new challenges to the traditional intellectual property legal system. In this context, the legal system must continually adjust and improve to adapt to the rapidly changing technological environment, protect

innovation, and incentivize creation. This paper will further explore these challenges and propose corresponding countermeasures to provide reference for legal practice and policy-making.

### **3. NEW CHALLENGES FACED BY INTELLECTUAL PROPERTY LAW IN THE DIGITAL ECONOMY ERA**

#### **3.1. Definition and Protection of Data Rights**

As a crucial resource in the digital economy era, data's property rights definition and protection have become new legal challenges. Traditional intellectual property laws primarily protect tangible intellectual creations such as inventions and literary works. However, the intangible and fluid nature of data complicates its property rights protection. The processes of data generation, collection, storage, processing, and use involve multiple stages, often leading to unclear ownership and rights disputes. Additionally, the trends of data sharing and openness further challenge data protection. Balancing data property rights protection with the promotion of reasonable data flow and utilization has become an urgent issue for the legal community to address.

#### **3.2. Legal Status of AI-Generated Works**

The development of artificial intelligence technology enables machines to autonomously create original works, such as literature, music, and paintings. The legal status of these AI-generated works remains undefined [8]. Currently, the law lacks clear provisions for the rights protection of AI-generated works, primarily in two aspects: whether they should be granted intellectual property protection and how to define the rights holder. The existing legal system usually recognizes natural persons or legal entities as creators, which is not suitable for the unique situation of AI-generated works. Additionally, determining the originality and creativity of AI-generated works is another major issue facing the legal community.

#### **3.3. Cross-Border Infringement Issues**

Digital technology breaks down geographical boundaries, making intellectual property infringement behaviors cross-border in nature [9]. Cross-border infringement includes the transnational copying, dissemination, and use of others' intellectual property, posing significant challenges for rights holders to protect their rights. Different countries have varying legal systems and enforcement strengths, leading to issues in the applicability of laws, jurisdiction, and enforcement during rights protection. Furthermore, the anonymity and complexity of cyberspace make it harder to detect and trace infringement behaviors. Effectively protecting intellectual property globally and preventing cross-border infringement have become crucial challenges in legal practice.

#### **3.4. Internet Platform Liability Issues**

Internet platforms play a vital role in the digital economy, but their responsibilities in intellectual property protection are unclear. Internet platforms are both key channels for information dissemination and hotspots for intellectual property infringement [10]. Platforms need to prevent infringement behaviors when users upload and disseminate content. However, excessive liability requirements may restrict platform development and innovation, especially in user-generated content (UGC) and social media platforms. Balancing platform regulatory responsibilities with innovation freedom and establishing a reasonable legal liability system have become focal points in the legal field.

### **3.5. Protection of Trade Secrets**

In the digital economy era, trade secrets as a crucial form of intellectual property face increased complexity in protection. Trade secrets include technical, operational, and management information, which are critical to a company's competitiveness [11]. With the widespread flow and sharing of data, the protection of trade secrets faces greater challenges. Increased risks of internal and external leaks require effective measures to protect trade secrets from being illegally obtained and utilized. Laws need to clearly define trade secrets, establish effective protection mechanisms, and ensure the security and confidentiality of trade secrets.

## **4. COUNTERMEASURES FOR THE CHALLENGES OF INTELLECTUAL PROPERTY LAW IN THE DIGITAL ECONOMY ERA**

### **4.1. Improving the Data Rights Protection System**

To address the challenges of data rights protection, improvements are needed at both legislative and enforcement levels. Legislatively, the ownership of data should be clearly defined, and a mechanism for establishing data rights should be developed to protect the legitimate rights of data owners. Drawing from existing intellectual property laws, a specialized data rights protection law could be created to set clear rules on data ownership, usage, and protection. Enforcement should be strengthened to rigorously combat illegal data acquisition and use. Establishing specialized enforcement agencies with professional technical personnel can enhance enforcement capabilities and efficiency. Additionally, international cooperation in data protection should be promoted to tackle challenges posed by cross-border data flow.

### **4.2. Clarifying the Legal Status of AI-Generated Works**

To address the legal status of AI-generated works, several countermeasures can be considered: First, explicitly grant AI-generated works legal status and include them within the scope of intellectual property protection to ensure their legitimate rights. Second, define the rights holder of AI-generated works, potentially recognizing the developers or users of the AI system as the rights holders and assigning them corresponding rights and obligations. Third, establish legal mechanisms to protect the rights of AI-generated works. For instance, adding specific provisions to copyright law to set clear rules for the copyright protection of AI-generated works. International legislation should also be promoted to create unified standards for the global protection of AI-generated works [12].

### **4.3. Strengthening Cross-Border Cooperation**

To effectively address cross-border infringement issues, international cooperation needs to be strengthened. Signing international treaties and agreements can help establish mechanisms for cross-border intellectual property protection. Countries should enhance cooperation between enforcement agencies to form a concerted effort against cross-border infringement. Specific measures include establishing a cross-border intellectual property enforcement cooperation network, conducting joint enforcement actions regularly, and improving the ability and efficiency of combating cross-border infringement. Creating an intellectual property infringement information-sharing platform allows real-time sharing and timely handling of infringement information. Strengthening cross-border intellectual property training can improve the professional capabilities and international cooperation levels of enforcement personnel. Additionally, the coordination and unification of international intellectual property laws should be promoted to reduce legal conflicts and application differences between countries, enhancing the effectiveness of cross-border intellectual property protection.

#### **4.4. Defining Internet Platform Liability**

To address the liability issues of internet platforms, a clear legal liability system should be established. On one hand, platforms should be required to strengthen content review and management to prevent users from uploading and disseminating infringing content. Platforms can use technical means such as filtering, monitoring, and identifying infringing content to improve the efficiency and accuracy of content review. On the other hand, reasonable exemptions should be provided to avoid excessive legal liability impacting platform development and innovation. For example, laws can stipulate that platforms do not bear responsibility for user-uploaded infringing content after performing reasonable review obligations. Platform cooperation should also be promoted to establish a shared governance mechanism for infringing content, jointly combating intellectual property infringement.

#### **4.5. Enhancing Trade Secret Protection**

To effectively protect trade secrets, a comprehensive legal protection mechanism should be established. First, clearly define trade secrets and their scope to ensure the accuracy and specificity of legal protection. Drawing from international standards, a unified trade secret protection law can be formulated to clarify the constituent elements and protection rules of trade secrets. Second, strengthen the enforcement of trade secret protection, rigorously combating trade secret infringement. Establish specialized enforcement agencies with professional technical personnel to improve enforcement capabilities and efficiency. Companies should also strengthen internal management and take effective measures to protect trade secrets. For example, establishing strict confidentiality systems and agreements, enhancing employee confidentiality education and training, and raising employees' confidentiality awareness and legal consciousness.

### **5. CASE ANALYSIS**

#### **5.1. Typical Case of Data Rights Protection**

An internet company discovered that its user data had been illegally acquired and utilized by a competitor, resulting in significant losses. The company legally pursued the competitor, and the court ultimately ruled that the competitor should compensate for the economic losses and cease using the illegally obtained data. This case highlights the need for further improvement in data rights protection legislation and enforcement to ensure the legitimate protection of data rights.

#### **5.2. Legal Dispute Over AI-Generated Works**

An AI company developed a system that created an original painting, and the company applied for copyright protection for the work. However, the copyright office denied the application, stating that AI-generated works were not eligible for copyright protection. The company filed an administrative lawsuit, and the court ultimately ruled in favor of the company, recognizing the copyright protection of AI-generated works. This case underscores the need to clarify the legal status of AI-generated works to protect their legitimate rights.

#### **5.3. Legal Response to Cross-Border Infringement**

A multinational company discovered its patented technology was being infringed upon by several foreign companies. By collaborating with multiple enforcement agencies internationally, the company successfully addressed these cross-border infringement cases and received appropriate compensation. This case illustrates the importance of international cooperation and the establishment of mechanisms for cross-border intellectual property protection.

## **5.4. Legal Responsibility of Internet Platforms**

A social media platform was sued by a user for failing to timely remove copyright-infringing videos. The court held the platform partially responsible and required it to enhance content review and management. This case highlights the need for internet platforms to assume certain legal responsibilities in intellectual property protection, while also emphasizing the importance of reasonable exemptions to ensure normal platform operations.

## **5.5. Successful Case of Trade Secret Protection**

A high-tech company discovered its trade secrets had been illegally acquired and used by a competitor to produce similar products. The company legally pursued the competitor, and the court ultimately ruled that the competitor should compensate for the economic losses and cease using the illegally obtained trade secrets. This case highlights the importance of robust trade secret protection laws and enforcement for companies to safeguard their rights.

# **6. FUTURE DIRECTIONS**

## **6.1. Promoting the Integration of Law and Technology**

Intellectual property protection in the digital economy era requires the close integration of law and technology. Legislation and enforcement should fully consider technological advancements and use technological means to enhance the efficiency and effectiveness of intellectual property protection. Simultaneously, technological developments need legal guidance and regulation to ensure their legality and compliance.

## **6.2. Strengthening International Cooperation and Exchange**

Intellectual property protection in the digital economy era has global and cross-border characteristics, making international cooperation and exchange crucial. Countries should strengthen cooperation in legislation, enforcement, and judiciary to jointly address the challenges of intellectual property protection and improve global intellectual property protection standards.

## **6.3. Emphasizing Public Education on Intellectual Property Protection**

Intellectual property protection requires not only legal and institutional safeguards but also broad public participation and support. Various means should be used to strengthen the promotion and education of intellectual property protection, raising public awareness and fostering a social environment that respects knowledge and protects innovation.

## **6.4. Promoting Continuous Innovation in the Intellectual Property System**

The rapid development and changes in the digital economy era necessitate continuous innovation in the intellectual property protection system. The system should be timely adjusted and improved based on technological and market developments to ensure its adaptability and foresight, providing strong legal support for innovation and development.

# **7. CONCLUSION**

The advent of the digital economy era has brought unprecedented challenges and opportunities for intellectual property protection. With data becoming a new production factor, the development of artificial intelligence technology, the frequency of cross-border infringement, the rise of internet

platforms, and the increased complexity of trade secret protection, the traditional intellectual property legal system can no longer fully meet the needs of the new era. Therefore, it is necessary to legislate to clarify the ownership of data rights, establish mechanisms for confirming data rights, and strengthen enforcement to protect the legitimate rights of data owners. At the same time, the issue of the legal status of AI-generated works should be addressed by including them within the scope of intellectual property protection and promoting international legislation to establish unified global standards. Cross-border infringement issues require enhanced international cooperation, through international treaties and agreements to establish cross-border intellectual property protection mechanisms, and strengthened collaboration between enforcement agencies to jointly combat cross-border infringement. Regarding internet platform liability, a clear legal responsibility system should be established, requiring platforms to strengthen content review and management to prevent the upload and dissemination of infringing content, while providing reasonable exemptions to avoid excessive legal liability that could hinder platform development and innovation. Additionally, a comprehensive legal mechanism for trade secret protection needs to be established, clearly defining the scope and ensuring accurate and targeted legal protection, along with strengthened enforcement efforts, and effective internal management measures by enterprises. In summary, by improving legal systems, enhancing international cooperation, and promoting the integration of technology and law, we can build an intellectual property protection system that adapts to the digital economy, effectively incentivize innovation, protect creators' rights, and promote the healthy development of the digital economy.

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