



# How Can Institutional and Technical Improvements Enhance Copyright Protection in the Digital Economy?

**Sihan Wen**

Shanghai Shiwai Middle School, Shanghai 200000, China

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**Abstract:** We delve into the persistent challenges of copyright infringement in the digital era. It begins with an extensive literature review, analyzing the causes, impacts, and existing preventive measures against copyright infringements across the music, film, software, and publishing industries. This paper highlights the intricacies of copyright protection, points out the shortcoming of current measures, and advocates for innovative solutions.

**Keywords:** copyright; digital economics; institutions; technology

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## 1. Introduction

Copyright refers to the exclusive rights granted to creators over their creative outputs, encompassing works in the realms of literature, arts, and sciences, such as books, music, films, software, and artworks (Nill, A., & Geipel Jr, A., 2010). With the rapid development of the internet and digital technologies, the scope and depth of copyright protection have expanded significantly. In response to these challenges, the international community has placed increasing emphasis on copyright protection. Copyright protection is essential for the healthy development of the creative industries. As globalization and digitalization deepen, strengthening copyright protection is not only a legal and technological necessity but also a cultural and economic imperative.

## 2. Literary Review

### 2.1 History

The Statute of Anne, enacted in 1710 in Britain, is often heralded as the foundational copyright law, responding primarily to the challenges introduced by the advent of the printing press. Internationally, the Berne Convention of 1886 stands as a landmark effort to standardize copyright protection across borders. The late 20th and early 21st centuries witnessed a surge in the digital distribution of copyrighted materials, propelled by the emergence of peer-to-peer (P2P) file-sharing platforms (Postigo, H., 2012).

### 2.2 Causes

Economic incentives play a significant role in driving copyright infringements. This behavior can be understood through a cost-benefit analysis. For instance, infringers might purchase licensed online courses, illegally download them through stream ripping, and subsequently sell access at a reduced price. The formula for total revenue ( $totalrevenue = quantity * price$ ) highlights how a lower price can significantly increase the quantity sold, thus boosting the overall profitability for the infringer. The primary costs involved include the initial expense of obtaining the course and the potential risk of fines or legal action. However, the high profit margins often outweigh these costs, making copyright infringement an economically attractive albeit illegal activity (Yoon, C., 2011).

From a microeconomic perspective, music and movies, as typical public goods, exhibit characteristics of non-competition and non-exclusivity, leading to free-riding problems where consumers often obtain these contents through illegal channels for free.

Psychologically, selfishness is a predominant motive, where individuals prioritize personal gain over the legal and moral implications of their actions.

### 2.3 Current Measures

China's copyright system is based on the Copyright Law of the People's Republic of China, first enacted in 1990. This system integrates copyright law, administrative regulations, local regulations, administrative rules, judicial interpretations, and international treaties.

The cornerstone of U.S. copyright law is the Copyright Act of 1976, which significantly expanded the scope of protected

works and emphasized the economic rights of copyright owners (Weinreb, L. L., 1989). This flexibility allows for significant judicial discretion, which can lead to inconsistencies in the application of the fair use doctrine.

The UK's copyright law distinguishes between literary and artistic works in the general sense and specific categories of works, including industrial designs. This law, embodied in the Copyright Act of 1888 and subsequent legislation, emphasizes the exhaustion of rights principle and the moral rights of authors (Rahmatian, A., 2013).

### 3. Research Methodology

#### 3.1 Interviews

We conducted a detailed interview with Xiaolong Wu, a prominent content creator on Bilibili renowned for his innovative photography-related videos and courses. Wu boasts a substantial fan base exceeding 200,000 and has experienced significant copyright infringement impacts firsthand.

#### 3.2 Questionnaire

The questionnaire was designed to capture a wide range of perspectives on copyright infringement, including those of both creators and consumers. We targeted a diverse and random sample of WeChat users to participate in our survey, utilizing a demographic spread that encompasses various age groups, professions, and regions. Figure 1 shows the general logic of this questionnaire.

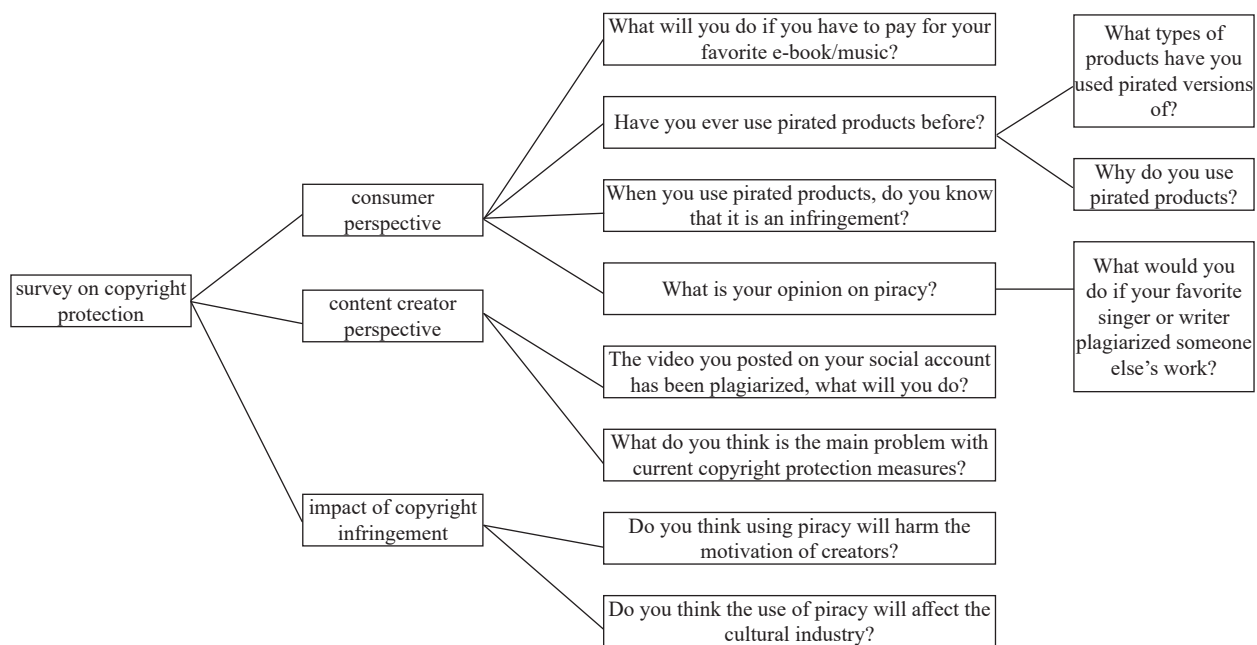


Figure 1. General logic of this questionnaire

#### 3.3 Mechanism Analysis

In analyzing the mechanisms behind the existing issues in copyright protection, several key problems and their underlying causes were identified.

Specific Problems:

(1) Technological Loopholes: Rapid advancements in technology have significantly outpaced the development of corresponding protective measures, making unauthorized copying, distribution, and consumption easier and less detectable. (Cohen, J. E. 2006).

(2) Insufficient Enforcement: Copyright laws often lack the enforcement strength necessary to deter violations effectively. (Capobianco, A., & Nyeso, A., 2018).

Underlying Mechanisms:

(1) Limitations of Legal Systems: Many legal frameworks are outdated and ill-equipped to address the complexities of the digital age, where digital goods are easily replicated and distributed across borders with little to no physical or economic constraints.

(2) Economic Incentives: For many individuals and entities, the economic benefits of engaging in copyright infringement often outweigh the perceived risks (Klein, B., & Moss, G. 2015).

## 4. Research Analysis

During a detailed interview, Xiaolong Wu shared his personal experiences with copyright infringement and his reactions to them. Despite facing several instances of his work being uploaded on platforms like YouTube by unauthorized users who profited from his content, Wu felt his options were limited and previous complaints had yielded minimal results.

There are a total of 470 samples in this questionnaire. The questionnaire started with questions about some basic personal information, such as gender and age.

**Table 1. Age Group of the Samples**

Age group	samples	Percentage (%)
<18	100	21.28%
19-29	81	17.23%
30-40	153	32.55%
>40	136	28.94%

The results show that the “film and television” category is the category that respondents have used the most piracy. The next question reflects the copyright awareness of the sample. 39.36% admitted that they knew that it was an infringement when using “pirated” products, and 50.64% did not know whether it was an infringement when using “pirated” products. Then, respondents are asked about the impact they think “piracy” has on the society. About 80% of the samples believe piracy will damage creators’ enthusiasm and affect the cultural industry.

## 5. Conclusion and Discussion

Summary of Main Findings:

(1) Public Awareness: Our investigation highlighted a critical gap in public knowledge regarding copyright laws and their implications.

(2) Regulatory Inefficiencies: The research identified that existing copyright frameworks are often ill-equipped to handle the nuances of digital content creation and distribution.

Proposed Solutions:

(1) Enhanced Public Education: There is a dire need for global initiatives aimed at educating the public about the importance of respecting copyright laws.

(2) Regulatory Overhaul: It is crucial to update copyright laws to reflect the digital realities of today’s media environment.

The emergence of LLMs introduces both new challenges and opportunities for copyright enforcement. The primary challenge is defining the copyright status of AI-generated works and managing the vast output of such models, which could potentially include content that infringes on existing copyrights without clear human authorship. Conversely, LLMs can be employed to strengthen copyright enforcement mechanisms. They could be programmed to analyze and monitor new uploads across platforms, comparing them against a database of copyrighted materials to detect and flag potential infringements automatically.

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