



## **MANIPULATION OF IPR AS A STRATEGIC TOOL IN ADDRESSING LIVE STREAMING MUSIC AND VIDEO INFRINGEMENT IN THE DIGITAL ERA**

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### **Abstract**

*According to John Locke's theory of Intellectual Property, "When a person puts his labour in an unowned object, his labour gets amalgamated with the new object that is then created, which cannot be separated without causing damage to the novel creation thus made. The creator then acquires natural rights over the object to which he applied his intellectual labour. Once the person acquires the property right, his original creation is protected from being used, transferred or manipulated by another person." Nowadays, it's not applicable as we're progressing towards the digital era therefore, confining IPR solely to ethical and moral rights will not have any significant changes. They're progressing towards individualism and business owing to their commercial interest. As we're well aware, Trademarks and Trade secrets play a pivotal role in various brandings and logos of companies however, Copyright is the longest-serving protection for the creators and plays an important role in protecting artistic works. Coming to music protection in digital platforms owing to unauthorised user upload platforms, intellectual property is an intricate interplay of artistic creativity and legal protection for online live-streaming music. The research employs the legal research method, undertaking a qualitative analysis of the legal instruments on copyright and IPR enforcement.*

*The paper first reviews the economic and social impact of live-streaming piracy on the topic. It then examines the imperative boundaries of current IPR systems in the digital environment. Another role of the research is to explore the relationship between technology and law with specific reference to automatic takedown systems, watermarking, and real-time monitoring systems. Last of all, it advises achieving the best course of action, which is a combination of regulatory adjustments, international cooperation, and technology enhancement for effective copyright protection. By entering into the*

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*realm of IP, the paper underscores the need for a responsive and innovative legislated approach to tackling live-streaming piracy while making digital content accessible to many creatives.*

**Keywords:** Live Streaming Infringement, Intellectual Property Rights, Digital Piracy, Copyright Enforcement, Technological Innovation

## **Introduction**

### **Background and Importance of IPR in the Digital Era**

Intellectual Property Rights (IPR) protect creative content rights in innovation while creating fair, competitive market environments for creative industries. Digital technology expansion has brought a complete transformation to the process of content production and its distribution and reception. Digitisation led to platforms such as streaming services joined with social media and cloud file storage, which boosted accessibility while creating new difficulties to protect copyrights. The core aspect of IPR, called Copyright law, offers creators complete authority to manage their artistic outputs, from musical works to filmed content and staged performances. Concurrently, with the switchover from traditional content delivery systems to digital streaming services, unauthorised content access has increased dramatically, and IPR enforcement has become difficult to perform. IPR protection in current times presents multiple dimensions since it requires resolving legal matters and technological capabilities alongside strategic policy decisions. The strategic management of IPR through legal, technological and economic strategies necessary to address new copyright infringement forms, especially within live streaming systems.<sup>2</sup>

### **The Evolution of Live Streaming Technology**

Real-time video and audio content broadcasting through live streaming technology has transformed creators to distribute their content to worldwide viewers. Milestones in live streaming technology derive from basic internet radio services and primitive video streaming systems that appeared during the late 1990s and early 2000s. Through enhanced internet bandwidth capabilities, better compression algorithms and cloud services, live streaming emerged as the main method for distributing content. Visual creators use YouTube Live, Twitch, Facebook Live and Instagram Live to stream real-time entertainment content for which they earn money by running advertisements and getting sponsorships or collecting subscription fees. The same technological advancements that make unauthorised streaming of copyrighted music and video content possible through digital piracy have increased exponentially. Illicit streaming sites engage in unlicensed rebroadcast activities that

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<sup>2</sup> Digital Content Creation and IP Laws Unveiled, <https://www.globalpatentfiling.com/blog/Navigating-the-Creative-Landscape-Digital-Content-Creation-And-Intellectual-Property-Laws> (last visited Feb 16, 2025).

result in major financial losses for content creators alongside production houses and streaming service providers when they stream concerts athletic events and entertainment shows. The quick and seamless recording of copyrighted content poses major challenges for law enforcement and technology because it requires enhanced IPR regulation and implementation methods.<sup>3</sup>

### **Rise of Music and Video Infringement in Digital Platforms**

Incorporating numerous live-streaming platforms into the market has created a steep surge in charges of copyright infringement targeting musical and video material. Live performance rebroadcasts without authorisation copyright music uploads and pay-per-view event streaming occur frequently in digital environments. Various infringers have discovered opportunities through decentralised content hosting with VPN usage to exploit legal ambiguities in modern copyright statutes. The rise of UGC platforms has introduced more complications in the copyright field since users post copyrighted material on their platforms without the author's permission. The content detection systems developed by major streaming services, including YouTube Content ID and Facebook Rights Manager, struggle to identify intricate copyright violation methods. The lack of uniform global regulations and weak enforcement mechanisms contribute to the increasing difficulty in controlling digital piracy. This growing challenge has prompted a re-evaluation of how IPR can be strategically manipulated to combat unauthorised streaming effectively.<sup>4</sup>

### **Objectives**

This study aims to analyse the role of IPR as a strategic tool in addressing live-streaming music and video infringement in the digital era. The research seeks to explore legal, technological, and policy-driven approaches to strengthening copyright enforcement. The primary objectives include:

- Examining the existing legal framework governing copyright protection in live streaming.
- Identifying key challenges in enforcing IPR against unauthorised digital broadcasts.
- Evaluating the role of technology, such as artificial intelligence (AI) and blockchain, in preventing copyright infringement.
- Assessing the economic and ethical implications of stricter copyright enforcement on content creators, platforms, and consumers.
- Proposing policy recommendations to enhance copyright protection while maintaining a balanced

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<sup>3</sup> Livestreaming | Description, History, Technology, & Concerns | Britannica, <https://www.britannica.com/technology/livestreaming> (last visited Feb 16, 2025).

<sup>4</sup> Admin Administrator, *How Live Streaming Can Expose You to Charges of Copyright Infringement*, ASIA IP, <https://www.asiaiplaw.com/article/how-live-streaming-can-expose-you-to-charges-of-copyright-infringement> (last visited Feb 16, 2025).

approach between innovation and access to content.

### **Research Questions**

- 1) How effective are current copyright laws in combating live-streaming infringement?
- 2) What technological solutions can be leveraged to enhance copyright protection in real time?
- 3) What are the economic consequences of live-streaming piracy on the media and entertainment industry?
- 4) How can content creators, platforms, and regulators collaborate to develop a balanced IPR framework?

### **Methodology and Scope of Study**

This research employs a multidisciplinary approach, incorporating legal analysis, technological evaluation, and economic assessment to understand the manipulation of IPR in live streaming. The study will be primarily based on qualitative research, utilising legal case studies, statutory reviews, and policy analyses from various jurisdictions. It will examine landmark copyright infringement cases related to live streaming to assess judicial interpretations and enforcement trends. Additionally, the study will analyse technological mechanisms such as digital rights management (DRM), AI-based content recognition, and blockchain-based licensing systems to evaluate their effectiveness in mitigating piracy.

The research will focus on international copyright regulations, with a particular emphasis on frameworks such as the Digital Millennium Copyright Act (DMCA) in the U.S., the Copyright Directive of the European Union, and India's Copyright Act of 1957. The scope of the study will include major live streaming platforms, both legitimate and illicit, to understand the technical and legal challenges in enforcing copyright. Furthermore, stakeholder perspectives, including content creators, copyright holders, platform operators, and policymakers, will be considered to provide a holistic view of the issue.

By comprehensively analysing the interplay between IPR, technology, and digital piracy, this study aims to contribute to the ongoing discourse on strengthening copyright protection in the digital age. The findings will provide valuable insights for legislators, industry players, and digital rights advocates in formulating a more effective and sustainable approach to combating live streaming infringement.

## **Understanding IPR in Digital Content Protection**

### **Intellectual Property Rights and Their Role in Media & Entertainment**

The media and entertainment industry benefits from Intellectual Property Rights (IPR) because these laws protect creators while enabling them to profit from their original content while also boosting new ideas. The main types of IPR protection include copyright alongside trademarks, patents, and trade secrets. Copyright emerges as the primary Intellectual Property Rights protection because digital technology enables simple content duplication and distribution, which artists and creators need. Through copyright protection, authors and creators maintain control of their work and have the authority to determine all its reproduction rights public performance uses distribution methods and adaptations.

The widespread adoption of digital streaming platforms has changed how people experience media content because it gives worldwide immediate access to music, filmed entertainment and real-time performances. Simple access has resulted in massive unauthorised use and piracy that reduces the revenue available to copyright holders. Copyrighted material distributed through YouTube and other streaming platforms requires valid licenses because Spotify and Netflix use Content ID and DRM technology to monitor unauthorised content. The existing measures for fighting illegal digital use remain insufficient because IP infringement continues to spread and requires improved laws to stop unauthorised content sharing. Strategic implementation of IPR protects artists and content creators from underpayment while it develops a balanced system upholding innovation and access to content.<sup>5</sup>

### **Copyright and Related Rights in Live Streaming**

Going live has emerged as a leading digital content delivery method that provides immediate broadcasts of music performances along with sports competitions, concerts, gaming streams and various other shows. The technological advancement produces complicated copyright issues for owners to resolve along with obtaining appropriate licenses while enforcing their rights. The copyright law protects original works in tangible form, yet live broadcasts lack coverage because they are unrecorded at first. The Berne Convention & the Rome Convention grant international copyright protection to live performances especially when recordings and transmissions occur

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<sup>5</sup> David Klein, *Legal Concerns for Social Media Influencers: Intellectual Property - KMT*, KLEIN MOYNIHAN TURCO (2021), <https://kleinmoynihan.com/legal-concerns-for-social-media-influencers-intellectual-property/> (last visited Feb 16, 2025).

instantaneously.<sup>6</sup>

Three legal rights, such as Performers' rights<sup>7</sup>, broadcasting rights and synchronisation rights, apply to live-streaming activities. The musician performing at their concert maintains their performing rights, and the event organisers and streaming platforms retain the right to distribute the broadcast. The unlawful transmission of live content, known as live-streaming piracy, is identified as illegal broadcast activity of copyrighted material without permission to use it. Illicit content transmission without rights holder payment is common in pay-per-view events and sports broadcasting services, so streaming services profit at the expense of rights holders.

YouTube, Facebook Live and Twitch use automated content recognition technology to identify and eliminate unlawful streams. Users who infringe copyrights use techniques that involve reflecting whole streams or editing audio but also practice cropping to avoid detection systems. Live-streaming copyrighted content demands a strong mix of legal safeguards, technological detection frameworks and stronger platform regulations, leading to proper protection for intellectual property in real-time streaming platforms.<sup>8</sup>

### **Digital Millennium Copyright Act (DMCA) and Similar Legal Frameworks**

Live streaming has established itself as an online distribution method through which people can watch music concerts and sports games and tune into gaming sessions and other events in real time. Technological advancement produces complicated copyright issues for owners to resolve, obtaining appropriate licenses while enforcing their rights. The copyright law protects original works in tangible form, yet live broadcasts lack coverage because they are unrecorded initially.<sup>9</sup> The Berne Convention<sup>10</sup> & Rome Convention grants international copyright protection to live performances, especially when recordings and transmissions occur instantaneously.

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<sup>6</sup> Oldham Li & Nie-Benjamin Choi, *Intellectual Property for Social Media Influencers*, LEXOLOGY (2022), <https://www.lexology.com/library/detail.aspx?g=f4416c8c-e704-431d-bb44-f7b18be4855c> (last visited Feb 16, 2025).

<sup>7</sup> Ayush Verma, *Performer's Rights under Copyright Law*, IPLEADERS (Apr. 23, 2021), <https://blog.ipleaders.in/performers-rights-under-copyright-law/> (last visited Feb 16, 2025).

<sup>8</sup> IPR News, *Broadcasting, Performing Rights and Copyrights: Navigating the Legal Landscape*, UNIMARKS LEGAL (2022), <https://unimarkslegal.com/ip-news/broadcasting-performing-rights-copyrights/> (last visited Feb 16, 2025).

<sup>9</sup> The streaming industry and the platform economy: An analysis - Jean K Chalaby, 2024, <https://journals.sagepub.com/doi/10.1177/01634437231210439#body-ref-bibr43-01634437231210439> (last visited Feb 16, 2025).

<sup>10</sup> Berne Convention - an overview | ScienceDirect Topics, <https://www.sciencedirect.com/topics/computer-science/berne-convention> (last visited Aug 23, 2024).

rights, and simultaneously, the event organisers and streaming platforms retain the right to distribute the broadcast. The unlawful transmission of live content, known as live-streaming piracy, is identified as illegal broadcast activity of copyrighted material without permission to use it. Illegal content distribution without rights holder payment is common in pay-per-view events and sports broadcasting services, so streaming services profit at the expense of rights holders.

YouTube, Facebook Live and Twitch use automated content recognition technology to identify and eliminate unlawful streams. Users who infringe copyrights use techniques that involve reflecting whole streams or editing audio but also practice cropping to avoid detection systems. A solution to these problems will require strong legal safeguards, technological enforcement methods, and stricter platform regulations to guarantee the protection of copyrighted material within live-streaming platforms.<sup>11</sup>

### **Fair Use, Public Domain, and Open Access Considerations**

Under copyright law, fair use remains essential because it permits restricted usage of copyrighted materials without rights holder permission. The following fair use scenarios exist within the live-streaming commentary and criticism section: educational demonstrations and derivative creations that qualify as parodies. A Twitch or YouTube content creator can utilise brief copyrighted footage or music during reviews as long as it satisfies the fair use test by showing certain conditions:

- The use belongs to transformative processes if it introduces fresh interpretations or messages.
- The type of material subject to copyright protection affects the analysis by determining whether the work holds factual or creative elements.
- Evaluating how the utilisation affects the monetary worth of the authentic material creates the fourth fair use evaluation criterion.<sup>12</sup>

Fair use is a legally unsure principle that results in regular conflicts between content originators and the copyright holders who protect their work. Automatic copyright monitoring systems on various platforms automatically report and delete content even though fair use exemptions could protect the material, leading to user discontent.<sup>13</sup>

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<sup>11</sup> Copyright Issues in the Digital Era: Challenges and Solutions, <https://lawctopus.com/clatalogue/clat-pg/copyright-issues-in-digital-era/> (last visited Jul 21, 2024).

<sup>12</sup> Sneha Mahawar, *Fair Use under Copyright Law*, IPLEADERS (Jan. 25, 2023), <https://blog.ipleaders.in/fair-use-under-copyright-law/> (last visited Feb 16, 2025).

<sup>13</sup> Fair Use in Copyright (BitLaw), [https://www.bitlaw.com/copyright/fair\\_use.html](https://www.bitlaw.com/copyright/fair_use.html) (last visited Feb 16, 2025).

Copyright law contains the public domain category that includes original content that has become unprotected because creators explicitly assigned it to the public domain or because it entered the public domain through time expiration or non-renewal. Content creators benefit widely from public domain works because these materials exist in free availability for direct use and meticulous modification. Researching the public domain status of intellectual property can prove difficult because countries have different timeframes for copyright expiration.

Open access initiatives, such as Creative Commons (CC) licensing, provide alternative copyright models that allow creators to share their works under customisable permissions. This approach promotes a more flexible and collaborative digital environment while ensuring holders retain control over how their content is used. In the live-streaming industry, open-access music and video libraries offer legally compliant alternatives to copyrighted material, reducing the risk of infringement.<sup>14</sup>

Balancing copyright protection with fair use, public domain access, and open-access licensing is essential for fostering a digital ecosystem that supports content creators and users. While stringent copyright enforcement is necessary to combat infringement, flexible copyright models encourage creativity, innovation, and the ethical sharing of knowledge in the digital era.

### **Live Streaming Infringement – Challenges and Legal Loopholes**

#### **Types of Infringement in Live Streaming (Piracy, Unauthorized Broadcasting, etc.)**

Live-streaming technology growth has brought up new legal and regulatory issues about intellectual property rights (IPR) despite improving digital content viewing methods. Three major types of infringement occur in live streaming, namely unauthorised broadcasting and content theft, which threaten the security of rights holders, creators and platform operators.

Unauthorised live transmission of copyrighted content through unlicensed broadcasters constitutes live-streaming piracy. Sports broadcasting suffers extensively from piracy through streaming services that broadcast premium athletics events without paying rights holder fees, including FIFA World Cup events and Olympics competitions and pay-per-view fights. The illegal streaming industry operates through unauthorised platforms and social media networks, which lure millions of viewers, resulting in major financial setbacks for professional broadcasters.<sup>15</sup>

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<sup>14</sup> Jack McKenna, *Open Access Copyright and Creative Commons Licenses*, MDPI BLOG (Dec. 5, 2023), <https://mdpiblog.wordpress.sciforum.net/2023/12/05/open-access-copyright/> (last visited Feb 16, 2025).

<sup>15</sup> Intellectual Property Rights in The Era of Digital Streaming - Academike, (2025), <https://www.lawctopus.com/academike/intellectual-property-rights-in-the-era-of-digital-streaming/> (last visited Feb 16, 2025).



The act of broadcasting without authorisation represents another infringement that involves the unauthorised streaming of content from movies to music concerts and gaming events. The unauthorised streaming of complete content, such as films and exclusive Netflix and Disney+ programming from YouTube, Twitch and Instagram Live, occurs frequently. Traditional piracy differs from unauthorised broadcasting because the latter happens in real-time legal enforcement challenges since takedown protocols might not respond fast enough before viewership begins.

Live-streamed content becomes the target of illegal distribution through three actions: including original content copying and recording to repackaging distributed content. Unauthorised streaming services use copyright-protected material from legitimate services to reconstruct modified versions (aspect ratio changes, logo overlays, audio distortions) before distributing them through mirror sites to bypass copyright systems. The illegal practices hurt the financial worth of original material, thus making it hard for creators to generate revenue from their work.<sup>16</sup>

As live streaming continues to grow, so do the complexities of detecting and preventing these infringements. The legal frameworks in place often struggle to keep pace with evolving digital threats, making it imperative to address these challenges with innovative enforcement strategies and stronger regulatory mechanisms.

### **Streaming Platforms and Liability Concerns (YouTube, Twitch, Instagram Live, etc.)**

Digital platforms execute two roles in copyright systems since they allow users to distribute live content and function as dispute intermediaries between rights holders and content creators. Copyright infringement responsibilities of streaming platforms remain disputed because both legal uncertainties and changing digital content-sharing practices exist.<sup>17</sup>

Streaming platforms YouTube, Twitch and live-streaming platforms Facebook Live, Instagram Live, and TikTok give users real-time broadcasting capabilities to defend their broadcast channels against unauthorised content from rights holders. Online platforms in the U.S. are protected through DMCA<sup>18</sup>, while those in the EU use Directive 2019/790 Article 17 to diminish their liability risk by implementing strong copyright defences. The protection measures automated content recognition

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<sup>16</sup> Legal Issues & Challenges Around Livestreaming, <https://www.mondaq.com/india/copyright/1501366/legal-issues-challenges-around-livestreaming> (last visited Feb 16, 2025).

<sup>17</sup> (PDF) The Role of Intermediary Liability in Balancing Copyright Law in the Digital World, [https://www.researchgate.net/publication/368661081\\_The\\_Role\\_of\\_Intermediary\\_Liability\\_in\\_Balancing\\_Copyright\\_Law\\_in\\_the\\_Digital\\_World](https://www.researchgate.net/publication/368661081_The_Role_of_Intermediary_Liability_in_Balancing_Copyright_Law_in_the_Digital_World) (last visited Feb 16, 2025).

<sup>18</sup> Digital Millennium Copyright Act, WIKIPEDIA (2023), [https://en.wikipedia.org/w/index.php?title=Digital\\_Millennium\\_Copyright\\_Act&oldid=1158379028](https://en.wikipedia.org/w/index.php?title=Digital_Millennium_Copyright_Act&oldid=1158379028) (last visited Jun 29, 2023).

systems, takedown mechanisms, and content filtering technologies to identify and remove infringing streams.

YouTube uses the Content ID system, which automatically examines live-streamed content through a database of copyrighted materials. Copyright holders can monetise matched content by choosing to block it directly or share monetary revenue with the platform. The Twitch platform enforces a permanent account deactivation policy as the third offence of copyright infringement against a user. The automated detection systems by platforms maintain streaming loopholes since pirates find ways to manipulate videos using different methods, such as altering playback speed and visual filter applications. The speed at which infringing content gets re-uploaded creates continuous obstacles for real-time enforcement involving copyright protection.

Platform liability exemption, a safe harbour, protects server operators from legal consequences when they promptly remove notified infringing content after assuming reasonable practices. This loophole exists, according to critics, because platforms do not actively prevent infringement, although they claim protection from direct liability. Streaming services maintain that strong oversight measures would cause platforms to excessively filter legitimate works while inhibiting fair-use applications and creative activities.

Balancing platform responsibility with user rights remains a complex issue in copyright law. The challenge lies in ensuring that platforms enforce copyright protection effectively without disproportionately restricting content creators' freedoms. Strengthening collaborative efforts between rights holders and platforms, refining automated enforcement technologies, and enhancing legal accountability measures are crucial in addressing liability concerns in live-streaming environments.

### **Jurisdictional Challenges in Cross-Border Infringement**

The challenge of solving live-streaming infringement becomes complex because digital piracy breaks through various legal jurisdictions. The international availability of live-streamed content proves difficult for enforcement agencies since traditional broadcasting laws do not apply to this distribution method.

Copyright laws display different regulations depending on the specific territory. The legal validity of a stream under fair use or private use exemptions within one country does not extend to other countries where it can thus constitute an infringement. The prohibition against copyright

infringement becomes increasingly difficult to enforce due to streaming sites that base their operations in countries where law enforcement does not effectively protect copyrights. Streaming piracy hubs remain successful in countries without substantial anti-piracy agreements because these nations prevent content owners from Europe or the United States from taking legal action against them.

VPNs create a jurisdictional problem when users employ them to discover blocked content by revealing alternative physical locations. Piracy websites use VPN methods to circumvent copyright blocker systems which creates difficulties for authorities who enforce intellectual property laws. Rights holders normally request website blocking injunctions, yet this approach proves ineffective because blocked sites get immediately replaced by alternative domains or mirror sites.

Global copyright laws enforced through the “*WIPO Copyright Treaty (WCT)*<sup>19</sup> and *TRIPS Agreement (Trade-Related Aspects of Intellectual Property Rights)*<sup>20</sup> seek to establish a standard system for managing digital copyright enforcement.” The failure to have standard implementation practices alongside inconsistent enforcement priorities among different jurisdictions remains a key barrier to live-streaming online infringements. Effective solutions to these jurisdictional challenges include stronger international cooperation improved digital IP enforcement systems and harmonized copyright legal frameworks.

### **Strategic Use of IPR in Combating Live Streaming Infringement**

The growing concerns over live streaming infringement necessitate a strategic and multi-faceted approach leveraging Intellectual Property Rights (IPR) as a defensive tool. The traditional enforcement mechanisms, though effective to some extent, are increasingly being challenged by the rapid evolution of digital piracy tactics. This chapter explores proactive copyright enforcement mechanisms, digital rights management (DRM), AI and blockchain technologies, and licensing strategies as critical elements in addressing live streaming piracy.

### **Strengthening Copyright Enforcement Mechanisms**

Copyright enforcement mechanisms form the first line of defense against unauthorized live streaming and digital piracy. Given the ease with which infringing content is shared online, robust legal and technological frameworks are essential to ensure effective deterrence and real-time takedown of infringing materials.

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<sup>19</sup> WIPO Copyright Treaty (WCT), <https://www.wipo.int/treaties/en/ip/wct/> (last visited Nov 28, 2023).

<sup>20</sup> *trips\_art13\_jur.pdf*, [https://www.wto.org/english/res\\_e/publications\\_e/ai17\\_e/trips\\_art13\\_jur.pdf](https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art13_jur.pdf) (last visited Dec 26, 2023).

One of the most significant advancements in copyright enforcement is the notice-and-takedown system, which is primarily governed by the Digital Millennium Copyright Act (DMCA) in the U.S. and similar legal frameworks globally. Under this system, rights holders can file infringement notices to digital platforms, which must then remove the unauthorized content. However, live streaming presents a unique challenge because pirated content is consumed in real-time, making traditional takedown mechanisms inefficient. In response, platforms like YouTube, Twitch, and Facebook Live have developed automated content recognition technologies, allowing for the detection and removal of infringing streams before they reach large audiences.<sup>21</sup>

Another critical enforcement strategy is the graduated response system, also known as the “three-strikes rule”, where platforms issue escalating warnings and penalties to repeat infringers. Some jurisdictions, such as France’s HADOPI law, have implemented similar systems at the ISP level, wherein users who engage in repeated copyright violations face penalties, including internet service restrictions. While effective, critics argue that such measures risk over-blocking legitimate content and penalizing users without due process.<sup>22</sup>

Additionally, geo-blocking and ISP-level filtering are gaining prominence as enforcement tools. Rights holders often work with internet service providers (ISPs) to block access to known piracy websites, preventing users from accessing unauthorized live streams. However, VPNs and mirror sites often render such measures ineffective, necessitating continuous updates and real-time monitoring of infringing sites.

Despite the advancements in enforcement mechanisms, digital pirates continue to exploit legal loopholes, jurisdictional challenges, and evolving technology to circumvent restrictions. Therefore, strengthening copyright enforcement requires global cooperation, real-time detection technologies, and tighter platform accountability measures to effectively curb live streaming infringement.

### **The Role of Digital Rights Management (DRM)**

Digital Rights Management (DRM)<sup>23</sup> plays a pivotal role in preventing unauthorized access, copying, and distribution of copyrighted content. DRM systems use encryption, access control, and

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<sup>21</sup> recordoflaw, *Digital Piracy and Copyright Enforcement: Approaches to Tackling Online Infringement*, RECORD OF LAW (Sep. 12, 2024), <https://recordoflaw.in/digital-piracy-and-copyright-enforcement-approaches-to-tackling-online-infringement/> (last visited Feb 16, 2025).

<sup>22</sup> Social media and Intellectual Property (IP): Part I- Protection and Ownership | BananaIP, <https://www.bananaip.com/social-media-and-intellectual-property-ip-part-i-protection-and-ownership/> (last visited Feb 16, 2025).

<sup>23</sup> Digital Rights Management (DRM), <https://studylib.net/doc/5217347/digital-rights-management--drm-> (last visited Dec 26, 2023).

digital fingerprinting to secure digital media, making it harder for infringers to redistribute protected content without permission.

A widely used DRM standard is Google Wide Vine, Microsoft PlayReady, and Apple Fair Play, employed by streaming services like Netflix, Amazon Prime Video, and Disney+. These technologies encrypt live-streamed content, ensuring authorised users with valid credentials can access and view the material. DRM also enables session-based watermarking, allowing content providers to track leaks and identify the sources of unauthorized broadcasts.<sup>24</sup>

For live streaming platforms, multi-DRM solutions are becoming increasingly essential. Multi-DRM technologies integrate multiple protection layers, ensuring content remains secure across different devices and operating systems. In addition to encryption, DRM technologies often incorporate token-based authentication, time-limited playback, and screen recording restrictions, preventing unauthorized screen captures or stream rerouting.

However, despite the benefits of DRM, some users and digital rights advocates criticize it for limiting consumer rights and fair use access. Issues such as device compatibility, regional restrictions, and limitations on personal storage create challenges for legitimate consumers. Additionally, DRM itself is not foolproof cracked DRM versions and piracy groups often find ways to bypass encryption, necessitating continuous updates and enhancements to DRM technologies.

Nevertheless, the strategic use of DRM in live streaming environments remains one of the most effective means of preventing real-time piracy and unauthorised distribution, complementing traditional copyright enforcement mechanisms.

## **AI and Blockchain for Real-Time Copyright Protection**

The combination of Artificial Intelligence and Blockchain Technology creates disruptive solutions that help prevent copyright violations in real-time along with digital piracy activity.

### **Artificial Intelligence for Copyright Detection**

AI-powered systems now operate in automated copyright enforcement to locate unauthorised live stream content before big viewer audiences experience it. AI-based copyright protection tools currently used in the market include:

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<sup>24</sup> Importance of Intellectual Property for Social Media Influencers and Content Creators | LexOrbis, (Jan. 17, 2022), <https://www.lexorbis.com/importance-of-intellectual-property-for-social-media-influencers-and-content-creators/> (last visited Feb 16, 2025).

The Content ID system of YouTube monitors new uploads and live streams in real time and verifies the content against its database of copyrighted material. Between blocking and monetisation, content tracking options become available to the rights holder when matching occurs with detected content.

Facebook Rights Manager uses AI algorithms to scan live content with videos and music for rights holder protection when managing unauthorised streams.<sup>25</sup>

The automated takedown bots enable real-time piracy monitoring of social media sites and other platforms, which immediately notify their content to both platforms and ISPs.

AI-based copyright protection demonstrates excellent efficiency but needs ongoing system development because it faces problems regarding wrong matches and changing piracy methods and restrictions related to machine learning systems.

### **Blockchain for Digital Content Protection**

Through decentralisation, blockchain technology offers enhanced transparency and security it is better for managing copyright protection in live streaming platforms. Rights holders gain several benefits when they implement blockchain-based solutions.

- Digital assets must carry embedded stored information ownership, which defends them from unauthorised replication.
- A system of smart contracts enables automated licensing procedures and distributes payment to all involved stakeholders.
- The system enables the tracking of copyrighted content in real-time, which can identify piracy through digital signatures.

Computer programming protocols built upon Blockchain technology are active in music and video distribution industries to track unauthorised content use through secured digital ledgers. AI and blockchain systems produce an effective method to detect copyright infringements immediately and enforce copyright ownership rights within live streaming platforms.

### **Role of Licensing Agreements and Monetization Strategies**

Through a forward-thinking licensing approach, rights holders will avoid piracy better while receiving suitable payments for their productions. Through collaborative licensing structures, digital content can be monetised by platform users, content creators and distributors together without

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<sup>25</sup> Niva Elkin-Koren, *Contesting Algorithms: Restoring the Public Interest in Content Filtering by Artificial Intelligence*, 7 BIG DATA & SOCIETY 2053951720932296 (2020).  
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exposing themselves to excessive infringement chances.

#### Types of Licensing Models

1. Streaming platforms YouTube by association with Twitch and TikTok reach agreements with content creators and record labels and studios through Platform-Based Licensing to assist them in legally displaying copyrighted materials in exchange for sharing advertising proceeds with owners of rights.
2. The entertainment sector uses subscription packages like Netflix and Spotify alongside pay-per-view access resembling UFC and WWE to sell premium content through necessary payments.
3. People who create small amounts of content benefit from Micro-Licensing Creative Commons platforms, enabling them to license their content at lower prices, thus driving legal distribution without needing pirated materials.<sup>26</sup>

Business strategies combining advert revenue co-partnerships and paid content platforms have established a secure business framework which motivates proper streaming and reduces copyright violation risks.

#### **Policy and Regulatory Approaches to Address Digital Piracy**

Digital piracy control and live streaming infringement defence require a complete policy and regulatory system performing intellectual property protection while handling digital rights and technological progress. Various laws on the global and national level work to stop the unauthorised streaming of copyrighted content. These measures become controversial since they face opposition from new technological advances, difficulties from jurisdictional boundaries, and enforcement obstacles. The chapter examines public anti-piracy laws in combination with industry associations' efforts and judge-aligned decisions to evaluate present-day piracy protection strategies.

#### **Global Legal Frameworks for Addressing Live Streaming Infringement**

Live streaming infringement requires international cooperation because the problem spans across borders which the “*World Intellectual Property Organization (WIPO) Copyright Treaty (WCT) and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the Digital Millennium Copyright Act (DMCA)*” jointly address. The legal agreements supply fundamental rules to manage digital copyright issues. However, their implementation differs among jurisdictions.

The WIPO Copyright Treaty (WCT) protects copyright rights in digital transmissions by granting

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<sup>26</sup> Banashree Roy & Nisha Sarma, *UNDERSTANDING THE IMPORTANCE OF INTELLECTUAL PROPERTY FOR CONTENT CREATORS AND SOCIAL MEDIA INFLUENCERS*, 2.  
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rights for live streaming and digital delivery. All countries that signed the agreement must state proper procedures to tackle unauthorised online distribution of copyrighted content. Implementation standards between different jurisdictions produce gaps that allow infringers to take advantage of.

Through the TRIPS Agreement, member states of WTO must establish legal mechanisms to respond against violations of intellectual property rights, including digital piracy. All countries joining the TRIPS arrangement must establish civil and criminal penalties to penalise copyright infringement acts. The lack of explicit content about live streaming piracy in TRIPS means every country must design guidelines for emerging digital piracy patterns.

The Digital Millennium Copyright Act (DMCA)<sup>27</sup> presents one of the most extensive authorities in the United States to regulate digital piracy. The notice-and-takedown procedure defined under this law allows copyright holders to demand digital platform content removals. Critics point out that DMCA enforcement procedures move slowly after infringed content appears but before takedown orders are completed, thus making the system unfit to combat real-time piracy because offenders switch their actions to new platforms.

The European Union's Copyright in the Digital Single Market Directive (2019) established Article 17, which makes online platforms directly responsible for copyright violations through automated content detection technologies to block unauthorised streaming content. While this measure is proactive, it has raised concerns about over-blocking legitimate content & fair use and freedom of expression.<sup>28</sup>

Despite these global regulations, live-streaming piracy continues to thrive due to inconsistent enforcement, jurisdictional challenges, and technological evasions. Strengthening cross-border cooperation, increasing real-time takedown mechanisms, and enhancing platform accountability are crucial to making these legal frameworks more effective.

### **India's Legal Landscape and Judicial Interpretations**

India has made significant strides in copyright enforcement, particularly in response to rampant digital piracy in the entertainment industry. The primary legislative framework governing live streaming infringement in India includes:

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<sup>27</sup> Safe Harbors for Online Service Providers Under Copyright Law, JUSTIA (2019), <https://www.justia.com/intellectual-property/copyright/copyright-safe-harbor/> (last visited Nov 28, 2023).

<sup>28</sup> Bernd Carsten Stahl et al., *A European Agency for Artificial Intelligence: Protecting Fundamental Rights and Ethical Values*, 45 COMPUTER LAW & SECURITY REVIEW 105661 (2022).



- The Copyright Act of 1957 (as amended in 2012)
- The Information Technology Act, 2000
- Judicial precedents on digital piracy and website blocking

“Under Section 51 of the Copyright Act of 1957”, copyright infringement includes the unauthorised communication of a work to the public, covering live streaming of music, films, and sports events.<sup>29</sup> However, the Act does not explicitly address the emerging challenges of digital live streaming. The 2012 amendments introduced penalties for unauthorised digital reproduction and streaming but lacked clear provisions for real-time enforcement mechanisms.

The Information Technology Act, 2000 (IT Act) complements copyright law by empowering authorities to block access to infringing websites under Section 69A. This provision has been widely used in India to curb piracy, with courts issuing dynamic injunctions against pirate websites.

### **Judicial Interpretations and Anti-Piracy Orders**

Indian courts have played a proactive role in curbing live streaming piracy through site-blocking injunctions and dynamic injunctions:

The Indian judiciary has played a role in curbing digital piracy, particularly in live-streaming music, films, and sports events. Courts have relied on dynamic injunctions, site-blocking orders, and intermediary liability principles to prevent copyright infringement. However, challenges persist due to technological advancements, jurisdictional complexities, and evolving piracy models. This section explores key judicial interpretations and landmark anti-piracy orders shaping India's legal landscape.

### **Pre-emptive Injunctions Against Live Streaming Piracy**

Indian courts have increasingly issued pre-emptive (ex parte) injunctions against websites and platforms known for streaming copyrighted music, films, and sports events without authorisation. These orders aim to prevent piracy before or during live events to minimise revenue losses for rights holders.

### **Case Study: Star India Pvt Ltd & Anr. vs Jackstreams.Com & Ors on 6 April 2022**

Facts: Star India, which held exclusive broadcasting rights for the Indian Premier League (IPL), approached the Delhi High Court seeking an injunction against unauthorised live streaming of

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<sup>29</sup> Section 51 in The Copyright Act, 1957, <https://indiankanoon.org/doc/1038145/> (last visited Feb 16, 2025).  
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matches.

- Judgment: The court granted a John Doe order (Ashok Kumar order) directing internet service providers (ISPs) and intermediaries to block access to websites illegally streaming IPL matches.
- Impact: This case reinforced pre-emptive blocking measures as an effective tool against sports broadcasting piracy.

Similar pre-emptive orders have been issued for major events like the Cricket World Cup, FIFA World Cup, and Bollywood film releases.<sup>30</sup>

### **Dynamic Injunctions to Combat Mirror Websites**

Pirates often circumvent judicial orders by creating mirror websites and identical copies of blocked platforms hosted under different domain names. To address this issue, Indian courts have granted dynamic injunctions, allowing rights holders to request the blocking of newly identified pirate websites without filing fresh lawsuits.

### **Case Study: UTV Software Communication Ltd. v. 1337X.to & Ors. (2019)**

- Facts: UTV Software, a major Bollywood production house, sued multiple piracy websites for illegally distributing copyrighted films.
- Judgment: The Delhi High Court issued a dynamic injunction allowing the plaintiffs to request ISPs and domain registrars to block mirror and proxy sites of infringing platforms.
- Legal Principle: The court introduced a “rolling injunction” mechanism, making it easier for content owners to combat evolving piracy techniques.
- Impact: This ruling has become a landmark precedent, empowering courts to continuously expand website blocking measures without requiring rights holders to initiate multiple lawsuits.<sup>31</sup>

### **Liability of Online Platforms for Hosting Pirated Live Streams**

The question of platform liability in cases of live-streaming infringement has been debated in multiple instances. Indian courts have held that platforms facilitating copyright infringement can be held liable unless they take effective steps to prevent piracy.

### **Case Study: Tata Sky Limited vs YouTube LLC & Ors on 16 October 2023**

Facts: Tata Sky, a leading DTH service provider, sued YouTube for allowing users to stream

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<sup>30</sup> Star India Pvt Ltd & Anr vs Jackstreams.Com & Ors on 6 April, 2022, <https://indiankanoon.org/doc/122818095/> (last visited Feb 16, 2025).

<sup>31</sup> Utv Software Communication Ltd. ... vs 1337X.To And Ors on 10 April, 2019, <https://indiankanoon.org/doc/47479491/> (last visited Nov 28, 2023).

unauthorised content from its satellite channels.<sup>32</sup>

- **Judgment:** The Delhi High Court ruled that digital platforms must implement stringent content monitoring and remove infringing material proactively rather than relying on takedown requests.
- **Impact:** This case emphasised platform accountability and the need for AI-based content recognition systems to prevent real-time piracy.

Despite these rulings, platforms often claim “safe harbour” protection under Section 79 of the IT Act, arguing that they are not directly responsible for user-generated content. Courts continue to balance platform accountability with digital rights and freedom of expression.

### **Website Blocking Orders and the Role of ISPs**

Website blocking orders have become a standard anti-piracy remedy in India. Courts frequently direct ISPs to block access to websites hosting infringing content. However, these orders are sometimes challenged by over-blocking and collateral damage to legitimate users.

### **Case Study: Yash Raj Films v. Bharat Sanchar Nigam Ltd. (2022)**

- **Facts:** Yash Raj Films sought a court order to block multiple piracy websites streaming Bollywood films.
- **Judgment:** The Delhi High Court ordered ISPs to implement domain-wide blocking, preventing access to primary and mirror sites.
- **Criticism:** Critics argue that overly broad blocking orders can impact legitimate websites and raise concerns about internet freedom.<sup>33</sup>

A similar controversy arose in *Viacom18 v. Reliance Jio* (2023)<sup>34</sup>, where a blanket blocking order was challenged for affecting non-infringing content hosted on the same servers. Courts have since emphasised the need for narrowly tailored blocking orders.

### **Criminal Prosecution for Digital Piracy**

While civil remedies like injunctions and damages are commonly used, courts have also upheld criminal prosecution under the Copyright Act of 1957 and the IT Act of 2000.

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<sup>32</sup> Tata Sky Limited vs Youtube Llc & Ors on 16 October, 2023, <https://indiankanoon.org/doc/18140837/> (last visited Feb 16, 2025).

<sup>33</sup> Yash Raj Films Pvt. Ltd vs Bharat Sanchar Nigam Limited on 14 July, 2022, <https://indiankanoon.org/doc/117375131/> (last visited Feb 16, 2025).

<sup>34</sup> Viacom 18 Media Private Limited vs Union Of India on 18 January, 2018, <https://indiankanoon.org/doc/86850376/> (last visited Jul 18, 2024).

### **Case Study: Tamil Rockers Case (2020)**

- Facts: Tamil Rockers, a notorious piracy website, was targeted for illegally streaming newly released films.
- Judgment: The Mumbai Cyber Crime Cell arrested key operators under Sections 63 and 65 of the Copyright Act, leading to criminal penalties, including imprisonment and fines.
- Impact: This case highlighted the role of law enforcement in digital piracy enforcement.

Despite such actions, criminal prosecution remains rare due to jurisdictional challenges and the anonymity of online infringers.

### **Challenges and Future Directions**

While Indian courts have been proactive in granting anti-piracy orders, several challenges remain:

2. Enforcement Difficulties: Pirates frequently shift to new domains and VPN-based access, making enforcement reactive rather than preventive.
3. Safe Harbor and Platform Resistance: Digital platforms often claim safe harbour protection, delaying compliance with takedown requests.
4. Balancing Copyright Protection with Digital Rights: Blanket website blocking can lead to censorship concerns and affect legitimate content creators.
5. Cross-Border Jurisdiction Issues: Many piracy operations are based outside India, making extradition and international cooperation difficult.

To address these issues, India may consider:

- Stronger AI-driven copyright enforcement mechanisms
- Expanding real-time takedown capabilities for live-streaming violations
- Negotiating international treaties for cross-border copyright enforcement
- Reforming intermediary liability laws to hold digital platforms more accountable

Indian courts have played a critical role in shaping anti-piracy jurisprudence, particularly in the live streaming. Through dynamic injunctions, site-blocking orders, and pre-emptive injunctions courts have empowered copyright holders to combat piracy. However, technological challenges and enforcement gaps necessitate continuous adaptation of legal and policy measures. Strengthening real-time detection mechanisms, platform accountability, and international cooperation will be crucial in addressing live streaming infringement in India's digital landscape.

## **Ethical and Economic Considerations in Digital Copyright Protection**

### **Balancing Access to Content with Copyright Protection**

The modern age revolutionised how content gets made and travels to audiences for reception. Intellectual property protection through copyright laws requires builders of creative works to balance copyright protection with unrestricted, public access to knowledge with cultural materials. Finding an equilibrium between opposing rights proves essential when watching live-streamed music or videos. Both automatic content removals and geographic blocking as part of stringent copyright enforcement restrict access to educational content that requires transformation for scholarly uses. When copyright enforcement remains lenient, piracy grows highly prevalent, reducing income sources for artists and content creators. The fundamental goal remains to develop an enforcement system that enables company revenues to grow through copyright protections yet gives consumers legal options to obtain multiple types of content. Improved licensing systems and fair use standards worldwide DRM policies, which adjust to local economics and cultural realities, would help achieve this balance.<sup>35</sup>

### **Economic Impact of Live Streaming Piracy on Artists and Industries**

The growing trend of illegal live streaming creates substantial economic difficulties for the entertainment and music industry. Unlawful communication of concerts, movies and sporting events removes large revenue streams from artists alongside record labels and production companies. Every year, billions of dollars disappear because of digital piracy, but this damage primarily impacts independent artists and smaller media companies. These industries face financial downturns from declining physical album revenues and movie ticket sales, leading them to depend on online profits. Piracy prevents these revenue sources from reaching their targets. The operation of illegal streaming services without regulations for licensing fees, advertisements and royalty payments produces an uneven business environment for official content providers. Financial losses caused by piracy spread further to prevent new projects and strategic development plans from businesses and creative industries. To resolve these problems, a combination of methods must be implemented, which centres on British copyright law protection through AI monitoring and platform-rights holder collaboration for fair compensation practices.

### **Consumer Rights, Free Speech, and Innovation vs. IPR Enforcement**

Digital IPR enforcement activities create ethical dilemmas because they jeopardise the freedom of

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<sup>35</sup>Copyrights: Protecting Creators and Their Creative Expressions | Berkeley International Office, <https://internationaloffice.berkeley.edu/students/intellectual-property-guide-uc-berkeley-graduate-students/copyrights-protecting-creators> (last visited Feb 16, 2025).

consumers and their speech rights and negatively impact technological development. The valid interest authors have to defend their work can lead to negative consequences from intense enforcement techniques involving automatic content-blocking systems, severe punishment measures, and digital limitations that affect users. Digital copyright enforcement tools operated by YouTube and Twitch face criticism since they frequently mistake legitimate content, such as valuable original works and educational materials, parodies for illegal material, resulting in subjective censorship practices. Implementing strict copyright regulations prevents users from using digital content, restricting their creative modifications. Creating appropriate regulations remains a task because they need to preserve creator rights without hindering the development of an unobstructed digital atmosphere. Balancing copyright protection with digital freedom becomes possible by implementing fair use doctrines combined with transparent content moderation systems and AI technology, which detects piracy from legitimate use.

### **Future Trends in Digital Media Protection**

The landscape of digital copyright protection is rapidly evolving, with emerging technologies playing a crucial role in enforcement strategies. Artificial intelligence (AI) and blockchain technology are at the forefront of innovative solutions for copyright management. AI-powered content recognition tools can identify unauthorised live streams in real time, helping rights holders detect and take down infringing content more effectively. Blockchain-based smart contracts offer a decentralised approach to copyright enforcement by enabling automatic royalty distribution, ensuring that creators are compensated whenever their work is used. New legislative efforts, such as the European Union's Directive on Copyright in the Digital Single Market, signal a shift towards more robust copyright frameworks that hold online platforms accountable for user-generated content. However, the future of digital copyright protection will depend on striking a balance between technological advancements and consumer rights. Policies that promote ethical enforcement, fair revenue-sharing models, and collaborative industry efforts will be essential to navigating the complexities of live streaming infringement in the digital era.

### **Conclusion and Recommendations**

#### **Summary of Key Findings**

The digital era has significantly transformed the entertainment industry, particularly with the rapid rise of live-streaming platforms, making music and video content more accessible than ever. However, this increased accessibility has also led to widespread infringement, posing significant challenges to intellectual property rights (IPR). The research highlights that traditional copyright

enforcement mechanisms are increasingly ineffective against real-time streaming piracy. The study finds that a combination of technological advancements, such as artificial intelligence (AI) and blockchain, along with stringent legal frameworks, can enhance copyright enforcement. The role of Digital Rights Management (DRM), takedown notices, and automated content recognition systems has been critical but still faces limitations in effectively addressing real-time infringements. Additionally, jurisdictional complexities and the global nature of the internet make enforcement more challenging, requiring international cooperation and harmonisation of copyright laws.

### **Strengthening IPR Mechanisms for Digital Content Protection**

To effectively combat live streaming infringement, strengthening IPR mechanisms requires a multi-pronged approach. First, digital platforms must integrate AI-driven content identification systems to proactively detect and prevent unauthorized broadcasts. The use of blockchain technology can ensure transparency in content ownership and licensing, reducing the risks of unauthorized use. Additionally, reforming copyright laws to address the real-time nature of streaming is essential. Current legal frameworks often rely on post-facto enforcement, which is ineffective in cases where pirated content is streamed live and removed before action can be taken. Enhancing collaboration between content creators, digital platforms, and enforcement agencies can create a more robust system for preventing piracy. Furthermore, imposing stricter penalties on offenders and ensuring that takedown mechanisms are swift and efficient will reinforce the deterrent effect.

### **Recommendations for Lawmakers, Streaming Platforms, and Content Creators**

For lawmakers, there is a pressing need to update copyright laws to include provisions specifically addressing live-streaming piracy. Establishing stricter liabilities for platforms that fail to prevent infringement, coupled with incentives for those that actively combat piracy, can create a more balanced regulatory environment. Cross-border cooperation is crucial, as streaming platforms operate globally, and piracy laws vary from country to country. Developing international treaties and frameworks can help unify enforcement mechanisms.

Streaming platforms, on the other hand, must take a proactive role by implementing better technological solutions. AI-based monitoring, dynamic watermarking, and real-time tracking of illegal streams can significantly reduce unauthorised broadcasts. Platforms should also invest in user education, making audiences aware of legal alternatives to pirated content. Partnering with copyright holders to develop better licensing models can provide consumers with affordable and legitimate access to content, reducing the incentive for piracy.

Content creators and rights holders should leverage technology to protect their works more effectively. Utilising blockchain for transparent licensing, collaborating with anti-piracy organisations, and advocating for stronger copyright protection policies can help safeguard their creative assets. Additionally, adopting flexible business models, such as subscription-based services, pay-per-view options, and ad-supported streaming, can enhance revenue generation while discouraging unauthorised access.

### **Future Research Directions in Live Streaming and IPR**

While significant progress has been made in addressing live-streaming infringement, further research is needed to explore new technological, legal, and economic dimensions of the issue. One critical area for future research is the role of decentralised platforms and how blockchain can be integrated into IPR enforcement without creating additional barriers to legitimate content sharing. Additionally, studying the effectiveness of AI in real-time content moderation and its potential ethical implications is crucial. Future studies should also analyse the impact of evolving business models, such as non-fungible tokens (NFTs) and metaverse-based streaming services, on copyright protection.

Another vital aspect is the role of consumer behaviour in piracy. Understanding why users resort to unauthorised streaming, whether due to pricing issues, lack of access, or other factors, can help in designing more effective anti-piracy strategies. Moreover, cross-jurisdictional legal research can help develop a global enforcement framework that addresses the loopholes exploited by infringers. The convergence of IPR with cybersecurity laws to combat digital piracy more comprehensively is another emerging research avenue that warrants exploration.

In conclusion, while IPR remains a powerful tool for addressing live-streaming music and video infringement, its effectiveness depends on continual legal advancements, technological innovation, and global cooperation. Strengthening enforcement mechanisms, leveraging emerging technologies, and fostering collaboration among stakeholders are crucial in protecting digital content in an era dominated by real-time streaming. Future research should focus on refining these strategies to adapt to the ever-evolving landscape of digital piracy.

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