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Automated Digital Copyright Enforcement: Functional Balance on Transition from Safe Harbours towards Algorithmic Copyright Filtering System

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The research paper explores about the digital copyright enforcement by focusing on the transition from safe harbour provisions to algorithmic copyright filtering system. The study analyses the role of safe harbours in providing liability protections to internet intermediaries while fostering an open cyberspace. It also analyses about the algorithmic copyright filtering system by assessing their efficacy for mitigating copyright infringement while also balancing the interests of user. This study employs doctrinal legal research and it critically analyses the policy developments to assess the functional balance between the users, copyright owners, and online platforms. Most importantly, this study highlights the key challenges in copyright enforcement on internet. It finds that automated copyright enforcement introduces the concerns about fairness and transparency often ignoring the exceptions of fair dealing and resulting in the suppression of lawful content. Furthermore, it makes a crucial take that while automated digital copyright enforcement enhances efficiency, it may also compromise the interests of user if it is not regulated and makes emphasis on reforms. This study calls for the functional balance and underscores the necessary of collaborative efforts between policymakers, online platforms, and stakeholders to develop a balanced enforcement measure of digital copyright in this modern digital age.

Keywords: Copyright, Online Platforms, Safe Harbours, Internet Intermediary, Algorithmic Copyright Filtering System

The technological advancement in this twenty-first century has revolutionised content creation, its distribution and consumption, and it has enabled the users to access an overwhelming number of contents at the unprecedented scale. Its outlines have been influenced by advancements in the techniques of creating, replicating, and distributing copyrighted contents.[1] But this advancement have significantly impacted content publication, reproduction, and control and oversight, leading to a complex relationship between internet intermediaries and intellectual property law. The overwhelming accessibility of online platforms has accelerated the common practice of cutting, remixing, and reinterpretations of the copyrighted contents and with such widespread infringements the traditional enforcement mechanisms has proven increasingly ineffective in the "wind of creative destruction."[2] As a result, the need for more efficient digital copyright enforcement mechanism has become a pressing concern in this modern digital age.

Internet has influenced copyright policy in a significant manner by giving emphasis on creativity and also proving short-term gratification thereby attempting to balance content availability, control and oversight, consumer interests, and creator interests. Copyright law has often attempted to reconcile the rights of copyright owners with the interests of users through a substantive copyright doctrine like fair dealing. But due to the technological advancements and rise of internet has highlighted a gap between the legal framework and its practical enforcement.[3] The rise of internet has significantly disrupted the balance between copyright law and its enforcement mechanisms. Internet intermediaries often operate under the safe harbour provisions that overshadows substantive copyright law and shape the procedural mechanisms on resolving the copyright claims and disputes.

Across the world in line with the digital copyright framework of World Intellectual Property Organisation (WIPO),[4] safe harbour provisions are enacted by most of the countries under their copyright legislation like Section 512 of Digital Millenium Copyright Act, 1998 (United States);[5] E-Commerce Directive, 2000 and Article 17 of Digital Single Market Copyright Directive, 2019 (European Union);[6] Online Safety Act, 2023 and Copyright, Designs and Patents Act, 1998 (United Kingdom);[7] and Section 79 of the Information Technology Act, 2000 and Copyright Act, 1957 (India).[8] These provisions enable

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internet intermediaries notably online platforms to avoid liability for user-generated copyright infringements. These provisions protect internet intermediaries from liability for user copyright violations. It mandates online platforms to remove unauthorized content upon notice from copyright owners. These provisions were designed to strike a balance. It aimed to address the rising challenge of digital copyright enforcement by incentivizing internet intermediaries to collaborate with copyright owners helping to detect and remove infringing content materials. It also aimed to allow internet intermediaries to support open cyberspace with no extreme interfering and filtering.

Safe harbours impact content creators, online platforms, and users, and it tries to promote innovation and freedom of expression but effectiveness debated due to the unauthorized content sharing with copyright infringements. These provisions have made it cheaper as well as easier to remove content than to post it and it has led to many primary beneficiaries to engage in infringement. The primary objection to the adoption of safe harbours was the fear that it would become a "ceiling rather than a floor."[9] Copyright owners now have significant control over user-generated contents on the online platforms without ever sending takedown notices indicating a decline in the basic proposition of fair dealing.[10]

Internet intermediaries may adopt safe harbours compliance for cost-preference or providing liability relief and protecting content providers but it may lead to overaggressive enforcement against non-infringing users. Safe harbours should be restricted to online platforms that demonstrate the use of the most advanced filtering technology. Digital copyright infringement has led to insufficient manual enforcement with safe harbours creating strong incentives but not commands. Law impacts free expression through standard settings of non-state actors. The law does not impose more restrictions on such rights than copyright generally does.[11] It has led to the emergence of algorithmic copyright filtering system like YouTube's Content ID, and Facebook's Right Manger. In this system, copyright owners use algorithms to monitor infringements. Online platforms use these systems to process and initiate removal requests. This enforcement measures have very enhanced efficiency but also raised serious concerns about fairness, transparency, and the suppression of lawful contents by ignoring fair dealing which provides exceptions for valid usages of copyrighted contents. Algorithms are frequently kept confidential and protected by intellectual property making their usage opaque.[12] These transitions from safe harbours to algorithmic copyright filtering system has altered copyright landscape significantly. It has transferred enforcement powers from the legal authorities to non-state actors, i.e. privately held online platforms.

The relevance of digital copyright law has reached a critical point in this modern digital age affecting both users and creators. Safe harbours have significantly transformed the relations between "copyright law on books and the law in action."[13] The law has often influenced the decisions on publication and its permanence by altering intermediary incentives. The normative implications of this transition are challenging to evaluate. Online platforms act as gatekeepers balancing publication between user posts and copyright owners' removal with neither decision closely tied to copyright law content. In this background, this research paper studies about the digital copyright enforcement and critically analyses the transition from safe harbours to algorithmic copyright filtering system. The study evaluates the functional balance between users, copyright owners, and online platforms, offering a comprehensive understanding of the automated digital copyright enforcement.

Safe Harbours

Safe harbours provisions provide legal certainty to the internet intermediaries with the definitions of their actions and limits their liability to copyright infringement. The conditions stipulate refraining them from profiting from the infringing content by hosting it and implementing a notice-and-takedown system to promptly remove the infringing material upon outright notice by copyright owners. It seeks to prevent copyright infringements by mandating that internet intermediaries swiftly remove infringing content upon notice from copyright owners. In this process of digital copyright enforcement mechanism, online platforms act as neutral intermediaries and promotes more open cyberspace by adhering to specific requirements rather than acting as a legal gatekeeper of content. These provisions provide regulated entities with a legal alternative to regulatory action by allowing them to choose between general standard and specific rule compliance.

Safe harbours include a notice-and-takedown system for the purpose to balance the interests of copyright owners and online platforms. It allows copyright owners to submit formal takedown requests for infringing content which online platforms then reviews and removes if the claim is valid. Users can file counter-notices if they believe the takedown was unjustified and any remaining disputes requires legal resolutions. In these given perspectives, the online platforms have implemented automated digital copyright enforcement to identify and remove infringing content while adhering to safe harbours.

Online platforms within the notice-and-takedown system are not obligated to enforce copyright promoting democratization of media by allowing users to engage with content based on fairness. The cyberspace has facilitated the rise of user-generated content and participatory culture by promoting creativity and spontaneity in the cultural production.[14] Mass participation by users has promoted autonomy and flexibility inside the dynamic process of content creation.[15] Open networks are revolutionizing the way of traditional filter, publish and especially the filter sequence by simplifying the process of publishing and filtering. The freedom to upload and share content without immediate censorship or restrictions has enabled users to explore new forms of expression but they still face potential liabilities for (repeatedly) infringing copyrighted contents. Safe harbours offer legal protection for transformative and non-commercial appropriations of copyrighted contents by incorporating exceptions of fair dealing. Online platforms have now normalized non-commercial appropriations allowing mass media to be quoted, remixed, and repurposed. Some such appropriations are within guidelines of fair dealing but others fall into a legal grey zone and in some cases are abruptly infringing in the first instances. Fair dealing often depend on whether the original work is transformed for a different purpose and if the borrowed amount is reasonable in that context. Users can reference and critique popular culture while repurposing copyrighted contents for illustrative purposes.

The safe harbours provisions have been widely criticized by both copyright owners and free-speech advocates due to their controversial nature. Scholars warn against the chilling effect of safe harbours as their usage extends beyond copyright protection.[16] The notice-and-takedown system is a balanced approach to the issue of digital copyright enforcement.[17] Studies finds that the notice-and-takedown system may violate internet freedom, hinder academic research, hinder fair dealing, and also hinder competition and innovation.[18] Copyright owners argues that the provisions does not address online content piracy by urging internet intermediaries to make effective and adequate measures to safeguard their works.[19]

Internet intermediaries generally facilities online content piracy by posing a significant concern for copyright owners due to the ease of copying and sharing. The complexity and ambiguity surrounding contributory and vicarious liability allows copyright owners to hold online platforms responsible for user generated infringement. But safe harbours protect such internet intermediaries from direct liability as long as they respond to takedown notice and follow protocol-based procedures. Copyright owners can remove infringing content through large-scale takedown requests but this may ease non-compliant platforms to legal risks. Commercial entities are primarily utilizing takedown notices to combat copyright violations due to piracy and unauthorized distribution.

While online platforms mostly offer numerous benefits but their minimal enforcement requirements under safe harbours have led to widespread copyright infringement. Non-commercial creators often mistake in assuming that copyright law is inapplicable to them. Despite a significant portion of user-generated content being considered fair dealing or inconsequential, substantial volumes of content remain infringing. Internet presents considerable obstacles to the control of consumer behaviour and impedes the enforcement of copyright infringement laws in distributed networks. Notice-and-takedown system does not strongly encourage online platforms or users to fully understand the legal nuances of copyright compliance. The procedural dynamics of safe harbours often overshadow the substantive content of copyright law.

Nonetheless, it is crucial to note that notice-and-takedown system may not always be applied fairly. Copyrights owners often prioritize preventing copyright infringement but may neglect the protection of fair dealing and non-infringing content. The lack of proper investigation into the legitimacy of online content claims may lead to unjustified abuse by copyright owners.[20] Safe harbours offer a legal framework for copyright enforcement without requiring platforms to pre-screen all content by balancing rights protection with innovation.

Algorithmic copyright filtering system has improved enforcement efficiency but the system remains reactive. Copyright owners face the challenge of constantly monitoring platforms, submitting takedown requests, and navigating legal complexities, making enforcement resource-intensive. Infringing content when repeatedly reuploaded with modifications complicates enforcement efforts. The system is susceptible to misuse as some entities use takedown system to suppress competition, criticism, or fair dealing content. The limitations of this system are highlighted when a counter-notice is filed necessitating costly legal action for copyright owners. These challenges highlighted underscore the necessity for continuous reforms to guarantee an equitable and efficient digital copyright enforcement mechanism.

Algorithmic Copyright Filtering System

Copyright can potentially hinder free expression but it is also considered an "engine of free expression."[21] Online platforms have significantly facilitated innovation and free expression but these advantages come at a cost. Copyright owners who rely on commercial distribution models bear a significant portion of this responsibility. Advancements in technology have significantly benefited producers by reducing production costs and opening up new markets. But the problem persists, furthermore, due to its infringement. Copyright owners sometimes participate in mass "John Doe litigation" for ease and efficiency but this approach fails to work correctly, particularly when copyright infringers are placed in tandem.[22] The rise of online platforms based on user-generated content has exacerbated enforcement issues due to the overwhelming content by making manual monitoring and oversight mostly impractical. Despite removal of infringing material, it often reappears in slightly altered forms which exacerbated the issue of copyright owners. Copyright infringers frequently use pseudonyms and this complicates the process of tracking them and addressing repeat infringers. Cross-border enforcement faces another additional challenge due to the jurisdictional differences in copyright laws and it creates legal barriers for the effective actions.

Meanwhile in these perspectives, the notice-and-takedown system is deemed inadequate by copyright owners to handle the challenges of modern digital age. Copyright owners contend that internet intermediaries have both an ethical and legal responsibility to use filtering technology to address online copyright violations since manual enforcement is inadequate. The safe harbour provisions is a fundamental aspect of the modern digital age defining the legal obligations of online platforms in digital copyright enforcement. Copyright owners have traditionally been responsible for identifying and removing infringing material. Online platforms are required to remove content upon receiving notices but are not obligated to prevent reuploads. Algorithmic copyright filtering transfers the enforcement responsibility to online platforms who scan content against copyrighted databases before publication.

Joel Reidenberg predicted the emergence of algorithmic filtering for online behaviour, introducing the "Lex Informatica" technological standards for rules like of copyright policy.[23] Similarly, Lawrence Lessig introduced the concept of "code is law," stating that algorithms can act as a substitute for law in regulating specific behaviours.[24] Algorithms enable complex data analysis, quantitative evaluation, descriptive and predictive computing, and management based on proof to guide actions and decisions. Algorithmic copyright filtering system employs powerful technologies like fingerprinting, hash matching, pattern recognition, and watermark analysis to identify and prevent the dissemination of unauthorized content. Fingerprinting systems use spectrogram analysis for audio, and keyframe sampling for video, to generate unique digital signatures. These systems compare uploads against copyright owner's databases but struggle with modified content.

YouTube's Content ID is a good example of algorithmic copyright filtering enabling copyrights owners to block, monetize, or track infringing content using fingerprinting technology, against a vast copyrighted database. It enables copyright owners to recognize their creations with a digital identifier. It alerts copyright owners when a video-contents matches their work providing options like muting audio, blocking views, monetizing, or tracking viewership statistics.[25] Similarly, Facebook's Rights Manager uses algorithmic detection to allow copyright owners to claim ad revenue from unauthorized uploads rather than removing them outright.[26] The systems depict the ongoing struggle to balance digital copyright enforcement with user rights and online platform accountability.

Algorithmic filtering offers substantial advantages to online platforms, especially those that can invest in such technology. Internet intermediaries can regain

control over copyright disputes through these systems reducing the risks associated with safe harbours. Hosting user-generated content exposes platforms to potential legal threats and digital copyright enforcement reduces uncertainty by demonstrating proactive measures to prevent infringement.

Safe harbours provisions internet intermediaries adhering to notice-and-takedown system and repeat infringer policy but copyright owners and litigants challenge these provisions attempting to narrow their scope through judicial and legislative means. Safe harbours which are initially intended to protect online platforms from copyright liability have been sparked by copyright owners' litigation efforts, causing substantial legal uncertainty. Online platforms that claim to adhere to the law are at risk of facing prolonged court battles. Platforms hosting vast amounts of copyrighted contents have opted to exceed requirements of safe harbour and implement proactive filtering to mitigate litigation risks. YouTube's Content ID was shaped by Viacom's case which accused YouTube of egregious and extensive copyright infringement through enabling users to upload and watch videos owned by Viacom without authorization.[27] It was seen as a victory for copyright owners despite Viacom's unsuccessful attempt to enforce safe harbours liability. This long running court battle later ended with out-of-court settlement.

Digital copyright enforcement allows online platforms to negotiate with copyright owners securing broader licensing agreements and monetization strategies that benefit both parties beyond legal compliance. YouTube's Content ID favours for copyright agreements for licensing allowing allegedly infringing content use in exchange for profiting with advertisements. The system not only detects potentially infringing content but also enables copyright owners to monetize it instead of removing it. The system offers alternatives to monetization such as blocking or muting audio content when monetization is not feasible. The dynamic nature of copyright law necessitates a functional balance between enforcement, innovation, and user rights to maintain a harmonious relationship between online platforms, copyright owners, and users.

Automated digital copyright enforcement

To comprehend about the automated digital copyright enforcement, it is crucial to differentiate between the enforcement mechanism that operate within the safe harbours and those that operate outside of this provision. Algorithmic copyright filtering system differs from earlier enforcement methods due to the legal framework governing its application. It uses the powerful technologies to detect files, duplicates, similarities in user uploads, and embedded markers. This enforcement mechanism involves scanning content, comparing it to a copyrighted database, and if a match is found, the system blocks such uploads, redirects revenue, or issue strikes.

Internet intermediaries have beyond their legal responsibilities under the notice-and-takedown system by eliminating illegal content and proactively offering supplementary enforcement mechanism to copyright owners. For instance, Google takes voluntary measures against websites that are frequently targeted by takedown requests.[28] Google's Pirate algorithm offers a poor ranking to websites with many removal requests, making them harder to find in search results.[29]

The growing prevalence of digital copyright infringement has led to a growing reliance on algorithmic copyright filtering system for identifying potential violations. Manual enforcement is impractical due to the vast number of webpages and the constant upload of new content. Copyright owners utilize software to match online content with proprietary catalogues, and as takedown notices increase, online platforms have automated their response processes. The automated process as it became increasingly crucial in the cyberspace it has led to an intensified clashes between copyright owners and online platforms. Despite some human review in the enforcement process, the overwhelming volume of notices often leads to enforcement actions without proper oversight of human. Legal requirements mandate takedown notices to reflect a "good faith belief" in infringement but many gets automatically issued and processed.

Copyright owners choose reference files and match parameters but takedown notices' consequences are regulated by safe harbour provisions including procedures of counter-notice. Google facilitates the online submission of removal requests requiring the requester to specify the relevant Google product such as Google Search.[30] The requester is informed that Google may forward the original notice to the copyright owners if there are doubts about the complaint's legitimacy and may include the notification in the Google Transparency Report.[31]

Automated digital copyright enforcement allows online platforms and copyright owners to negotiate filtering technology design and implementation, and whether to use safe harbours or not. These systems offer greater flexibility than traditional copyright

enforcement methods. Algorithmic filters may either pre-emptively block potential contents that infringes copyright before to publication (*ex-ante* filtering) or remove it later subsequent to discovery of infringement of copyright (*ex-post* filtering). Online platforms can monetize contested content by redirecting advertisements revenue to copyright owners or monitoring it for data insights instead of immediate removal.

The policy option of algorithmic enforcement of safe harbours is considered superior.[32] Automated filtering platforms can bypass safe harbours, reducing user procedural safeguards, highlighting the significant difference between safe harbours and algorithmic copyright filtering system. For example, YouTube's Content ID permits copyright owners to mute or block user-generated videos without a formal takedown notice. If a video's visual or audio content matches the sample, it is considered to contain the copyrighted content.

Automated digital copyright enforcement offers online platforms and copyright owners significant flexibility but it also imposes a burden on user rights. Safe harbours mandates user safeguards like the right to counter-notice and other process. Algorithmic filtering system enforces safeguards that become discretionary relying on copyright policies set out by copyright owners and online platforms. This prompts apprehensions about the balance between freedom of expression and copyright protection. The question remains whether copyright owners and online platforms help to maintain open cyberspace for encouraging and promoting creativity and allowing exception of fair dealing or if automated digital copyright enforcement will lead to a more restrictive cyberspace.[33]

Critical analysis on functional balance

The public scrutiny of automated digital copyright enforcement faces technical barriers that are intertwined. The algorithmic filtering system complicates the assessment of how they make decisions due to the lack of transparency.[34] Automated enforcement often incorporates dominating applications of algorithms although it occasionally may involve the participation of human analysis. Algorithms, designed to promote certain standards and regulations, are intricate programs that programmers often find challenging to analyse.[35] Automated decision rules can efficiently apply rules that would be unfeasible under human application due to their capacity to incorporate an unlimited number of variables. Enforcement algorithms used by internet intermediaries significantly enhance their interpretating legal norms. The translation of legal mandates into code involves interpretation choices influenced by professional assumptions and private business incentives. The learning capabilities of algorithms provide an additional technological barrier to effective transparency in enforcement mechanism. Machine learning is a powerful tool that aids in identifying trends, relations, and hidden patterns in diverse data groups. Algorithms can modify their code to improve performance based on the user's experience. For instance, Google and Meta Platforms use multiple algorithm versions to evaluate their effectiveness but user interactions remain inconsistent with previous versions. Algorithms are systematically built-in with reactionary modality and led challenges like copyright false positives, risk of over-blocking, and lack of transparency and accountability leading a challenge to the functional balance between users, copyright owners and online platforms.

Copyright False Positives

Automated digital copyright enforcement leads to copyright false positives as the algorithmic copyright filtering system incorrectly identify content as infringing resulting in wrongful takedowns or restrictions. The extensive online activities of copyright infringements contribute to the issue of copyright false positives. Conventional copyright-dependent sectors have seen a decline in revenue attributed to the emergence of file-sharing technology, networking sites, and high-speed internet access. Copyright owners must either intensify enforcement against all infringers, despite public outrage, or face severe revenue losses.

Algorithmic enforcement can operate where algorithms search the internet for content indicating an infringement. Algorithms enable detection of a wider range of potential infringements at lower costs than manual enforcement but with significantly reduced accuracy. Moreover, pre-emptive blocking restricts content before publication limiting user appeal opportunities. Pre-emption can lead to mistakes in enforcing subjective, case-specific laws, like copyright restrictions, which are intended to be implemented at the discretionary choices of a privately held online platforms. This enforcement mechanism can lead to a variety of contested and uncontested false positives. The digital copyright

enforcement faces an unprecedented problem in this modern digital age due to the impossibility of filtering all infringements that leads excessive by copyright owners to offset losses and increase deterrence. This is fuelled by a deep sense of injustice and the economics of copyright enforcement.

The algorithmic copyright filtering system increases the likelihood of online platforms becoming increasingly restrictive, which was once largely open. The YouTube's Content ID often leads to numerous copyright false positives, or it can automatically block or monetize a video without infringing content.[36] It processes reference files from copyright owners converting them into digital fingerprints. Enforcement outcomes depend on copyright owner's choices, including blocking, muting, monitoring, or monetizing content. YouTube's polices and users' responses influence decisions on monetizing rights. If copyright owner's claims a user's video without contestation, the copyright owners collected all the associated revenue. If a user disputes a copyright claim, then the revenue is held in escrow. But many users may mistakenly believe the claim is legitimate or even fear the consequences. There are instances of fraudster exploiting the Content ID system to make fraudulent copyright claims and divert advertising revenue from users who are innocent.[37]

Meanwhile in this perspective, regulators should actively participate in the development of accountable algorithms for automated digital copyright enforcement that fosters collaboration and robust participation. Internet intermediaries can provide valuable data for regulators to determine the most effective algorithms. Regulators can alter algorithm default assumptions and can reduces false positives by collaborating with internet intermediaries and recognizing the limitations of computer codes as enforcement mechanisms.

Over-Blocking and Its Impact on Fair Dealing

Content creators often use fair dealing while producing their contents but algorithmic copyright filtering system can lead to unjustified content suppression, monetization redirection or muting the content. It raises concerns about the possibility of over-blocking or taking down non-copyright-infringing content. The landmark *Lenz v. Universal Music Corp* (2008) case established that copyright owners must consider fair dealing before issuing takedowns but algorithms continue to ignore this requirement.[38] Online platforms gets pressure from copyright owners to streamline content removal systems that will continue to raise concerns about potential over-enforcement of copyright.[39] Internet intermediaries uses algorithms to automatically moderate content and it has been criticized for potential over-blocking of lawful content due to automated decision-making.[40]

Moreover, pre-emptive content filtering system often oversteps cautions and it leads to the removal or restriction of legally permissible non-infringing content. Over-blocking, a practice that removes content without infringing on copyright, poses a significant issue as it can potentially restrict freedom of expression. The implementation of automated enforcement has produced numerous documented cases of overreach and abuse. A 2013 study analysed 1800 takedown requests from the Lumen database, finding 98.9% were automated, 1 in 25 did not match the allegedly infringing material, 13.3% were difficult to locate, 1 in 15 flagged for fair dealing, and nearly one-third had serious validity questions.[41]

Automated digital copyright enforcement is crucial for managing large-scale copyright infringement but its implementation requires very careful consideration. YouTube's Content ID exemplifies the difficulties linked to automated enforcement. YouTube's daily upload over hundreds of hours of video contents makes it tougher for online platforms to effectively detect and manually prevent copyright infringements.[42] The technology is excessively filtering and blocking contents that ought not to be restricted. The reliance on filtering technology presents significant challenges, especially in the context of fair use. False positives which can cause significant burden on users are inherent risks that require enhanced safeguards and dispute resolution mechanisms. The technology generates significant incentives for rational profit-maximizing entities to over-block legitimate content.

Content ID can automatically block, mute, monetize, or track flagged content when it matches creations of copyright owners with the contents of the users. This system often overlooks the fact that minor similarities do not constitute substantial infringement or that a work can be considered fair dealing. Copyright owners can escalate claims by submitting takedown requests which potentially leads to strikes and account suspensions without requiring a formal takedown notice or initial strike. The dispute resolution process is asymmetrical with initial challenges being returned to the copyright owners for

review without an independent oversight. Copyright owners can reinstate claims without consequences but also must decide at the appeal stage whether to issues a formal takedown notice potentially triggering legal scrutiny. The system favours copyright owners only by leaving users with limited options to dispute the wrongful claims.[37]

The monetization aspect of copyright enforcement complicates exceptions of fair dealing. Copyright owners may favour monetization over blocking, enabling platforms to profit from user content while restricting creators' revenue generation. Automated copyright enforcement poses a risk of normalizing the monetization of fair dealing, potentially undermining the doctrine itself. Monetization claims could potentially prevent users from profiting from their legally protected work if takedown notices are replaced by monetization claims as the default enforcement mechanism.[43] Monetization is often viewed as an implicit licensing mechanism, but this perspective overlooks the broader implications for user rights. If the contents of fair dealing are automatically monetized, copyright owners may discourage creators from producing contents due to financial disincentives and loss of creative autonomy.

Automated digital copyright enforcement should focus on reliable and effective mechanisms that recognizes fair dealing and improves algorithms while also ensuring users can contest false claims much effectively. The notice-and-takedown system criticized for free speech suppression without judicial oversight provides counter-notices and remedies for misrepresentation. Online platforms can impose content restrictions through automated digital copyright enforcement without appealing or holding them accountable for erroneous claims. Platforms can implement automatic blocking and monetization without the recourse of user, handle disputes through safe harbours.

Lack of Transparency and Accountability

Digital copyright enforcement basically occurs on privately held online platforms rather than public forums like courts.[44] These platforms play an influencing role on enforcement mechanism and regulates the interests of users that need to be balanced with the rights of copyright owners. Automated enforcement is essential because of its efficacy which may significantly modify enacted copyright laws. It significantly impacts a large number of people and material, influencing copyright policy through rules like filtering, removal, and blocking. It may alter copyright law's objectives by limiting the public availability of materials unless explicitly authorized by the copyright owner.[45] Concerns persist that the business incentives of online platforms may conflict with their duty to enforce copyright transparently.[46]

Legal challenges arise when enforcing accountability for automated digital copyright enforcement. Copyright laws may impede public literacy, a concern that might be mitigated by independent technical inquiry.[47] A well-designed and advanced enforcement mechanism could offer effective guidelines on fair dealing, use more nuanced filtering systems, and also ensure fair and efficient challenges to copyright claims. Algorithms can make accurate assessments of copyright infringement but they are susceptible to biases and errors. Machine-learning algorithms can enhance decision-making over time but algorithmic accountability remains a challenge especially when decision-making processes are unclear and lacks transparency. Internet intermediaries must offer legal recourse for wrongful takedowns, transparent appeal processes, and independent review mechanism to ensure fair enforcement mechanism. Platforms should disclose their copyright filtering systems' operation and allow external audits to evaluate their accuracy and fairness.

Internet intermediaries have the right to make private decisions about content on their platforms by filtering or removing infringing contents after notices. The notice-and-takedown system and automated copyright enforcement are altering policies and procedures narrowing the public-private divide. Privately held online platforms serves as judges and executioners by performing crucial public functions typically reserved for authorized governmental bodies.[48] Operational decisions are primarily made by copyright owners and platform operator rather than by users, legislatures, or courts. The decisions made by such functionaries basically lacks transparency and accountability of their choices that makes it difficult to assess the functions of enforcement mechanism or their alignment with legal principles.

Automated enforcement influences public discourse and it underscores the need for algorithmic accountability in the overall public sphere.[49] Business interests of online platforms are causing concern over potential compromises in their enforcement duties including unprejudiced treatment and transparency.[46]

The regulation of internet intermediaries for enforcement mechanism may bring essential controls and oversight by regulators. Automated enforcement must adhere to the rule of law and set of standards. These principles mandate the clear delegation of power and the establishment of clear rules to enable individuals to establish reliable expectations and make autonomous decisions.[50]

Conclusion

Digital copyright enforcement has transitioned further much significantly from the traditional legal frameworks to privately managed online platforms in this modern digital age. This transition has resulted in a fundamental change in how copyright is enforced from state-regulated legal proceedings towards online platforms-driven automated enforcement. But challenge persists with this transformation to maintain a functional balance between protecting the copyright and preserving the interest of the users. Internet intermediaries now function as both copyright enforcers and gatekeepers of the digital expression and behaviours in the cyberspace but this dual role raises concerns on whether there exists functional balance between users, copyright owner and online platforms.

Safe harbours marked the beginning of the transition from publicly regulated to privately held enforcement mechanism which is now fully automated. Both notice-and-takedown system and algorithmic copyright filtering system enhance the relevance of the copyright and its impacts on the users but also it is more complex. While automated enforcement mechanism has enabled large-scale digital copyright protection and has higher potentiality to decrease infringement instances. But the designs of such enforcement mechanisms determines whether they promote openness or prior restraint. The primary concern is the risk of algorithmic bias and the unintended consequences of automated enforcement as they have also introduced the systemic issues such as copyright false positives, over-blocking, and a lack of transparency and accountability. Copyright false positives and overreaching the takedown mechanism impact the users and independent creators much disproportionately as it limits their ability to monetise and share their contents on cyberspace. Furthermore, the lack of transparency of algorithmic decision-making illustrates an accountability issue as such enforcement decisions are generally made without adequate oversight and recourse.

Finding a functional balance in this way that automated digital copyright enforcement mechanisms could be more problem solving if it adopts monetisation instead of takedown and blocking as a response of copyright infringement. Monetisation has been often criticised as a hindrance to fair dealing and other forms of non-infringements. But the implementation of such mechanisms could enhance the accessibility of online platforms to user content that falls between fair dealing and infringement which potentially benefits users as well. In this manner, the algorithms that primarily enforce safe harbours and adhere to delicate established standards of functional balance can benefit from regulated mechanisms for automated digital copyright enforcement. While online platforms have a vested interest in satisfying the creators and their copyright protections, they must also uphold the fair dealing and prevent the suppression of the lawful content being used by the users. The functional balance, therefore, falls on the enhancements of delicate standards of structured mechanism like internal scrutiny and external regulatory inspections of the internet intermediaries. For this instance, online platforms must implement robust appeal mechanisms that include human review with clear guidelines on fair dealing and safeguards against the fraudulent copyright claims. Also, the policy reforms should be ensured to promote a tiered approach to copyright enforcement that differentiates between the blatant piracy and the legitimate content usage.

The effectiveness of automated digital copyright enforcement much depends on the choices and polices made as accordingly by the online platforms and copyright owners. The safe harbour provisions remain one of the critical safeguards that provides internet intermediaries with the ability to negotiate a balanced enforcement measure. But also, the safe harbours are weakened and the online platforms may face greater pressure for implementing the restrictive copyright policies that limits the creativity of the users. Thus, a collaborative effort between legislators, platforms, and stakeholders addressing these systemic issues requires multilayered reforms targeting transparency, due process, and global coordination. First, legislative mandates should compel platforms to disclose algorithmic performance metrics including false positive rates and fair use recognition accuracy. Second, user protections must be strengthened through standardised counter-notice portals (perhaps WIPO-hosted) and meaningful penalties for fraudulent claims. Third, international harmonisation is crucial to prevent

jurisdictional arbitrage. Only such balanced approaches are vital for the purpose of moving forward to develop an enforcement system not only for the copyright protections but also to foster the innovation, creativity, and most importantly, freedom of expression in this modern digital age.

References

1 Litman J, Copyright legislation and technological change, *Oregon Law Review*, 68 (2) (1989) 353.
2 Ku R, The creative destruction of copyrights: Napster and the new economics of digital technology, *University of Chicago Law Review*, 69 (1) (2002) 263.
3 Postigo H, The Digital Rights Movement: The Role of Technology in Subverting Digital Copyright (MIT Press, Cambridge), 2012, 27.
4 World Intellectual Property Organisation Copyright Treaty, 20 December 1996, 2186 UNTS 121; World Intellectual Property Organisation Performances and Phonograms Treaty, 20 December 1996, 2186 UNTS 203.
5 Digital Millennium Copyright Act, 17 USC § 512 (1998).
6 Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, OJ L 178, 17 July 2000; Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market, OJ L 130, 17 May 2019, art. 17.
7 Copyright, Designs and Patents Act 1988, c 48 (UK).
8 Information Technology Act, No 21 of 2000, § 79, India Code; Copyright Act, No 14 of 1957, India Code.
9 Gibson J, Risk aversion and rights accretion in intellectual property law, *Yale Law Journal*, 116 (5) (2007) 898.
10 Goldman E, How the DMCA's online copyright safe harbour failed, *NTUT Journal of Intellectual Property Law & Management*, 3 (2) (2014) 198.
11 Balkin J, Old-school/new-school speech regulation, *Harvard Law Review*, 127 (2014) 2296.
12 Burrell J, How the machine 'thinks': Understanding opacity in machine learning algorithms, *Big Data & Society*, 3 (2016) 1.
13 Pound R, Law in books and law in action, *American Law Review*, 44 (12) (1910) 36.
14 Lee E, Warming up to user-generated content, *University of Illinois Law Review*, (2008) 1459.
15 Benkler Y, Coase's Penguin, or, Linux and the nature of the firm, *Yale Law Journal*, 112 (3) (2002) 369, 374.
16 Cahn T & Bricker R, Rough justice: Extending the DMCA's self-policing "take-down" model beyond copyright law, *Golden Gate University Intellectual Property Law*, 1 (2012).
17 Reichman J, Dinwoodie G & Samuelson P, A reverse notice and takedown regime to enable public interest uses of technically protected copyrighted works, *Berkeley Technology Law Journal*, 22 (2007) 994.
18 Elkin-Koren N, *After twenty years: revisiting the copyright liability of online intermediaries*, In: *The Evolution and Equilibrium of Copyright in the Digital Age* (Cambridge University Press, Cambridge), 2014, 14
19 Motion Picture Association of America, Comments, PTO-C-2013-0036 (2013).
20 Marsoof A, 'Notice and takedown': A copyright perspective, *Queen Mary Journal of Intellectual Property*, 5 (2) (2015) 203.
21 Netanel N, *Copyright's Paradox* (Oxford University Press, Oxford), (2008) 4.
22 Bridy A, Is online copyright enforcement scalable?, *Vanderbilt Journal of Entertainment & Technology Law*, 13 (4) (2011) 736.
23 Reidenberg J, Lex informatica: The formulation of information policy rules through technology, *Texas Law Review*, 76 (1998) 556-58, 562.
24 Lessig L, *Code: Version 2.0* (Basic Books, New York), 2006.
25 YouTube, How Content ID works, https://support.google.com/youtube/answer/2797370 (accessed on 1 March 2025).
26 Facebook, Copyright, https://www.facebook.com/help/1020633957973118 (1 March 2025); Facebook, Overview: Rights Manager, https://www.facebook.com/rights_manager (accessed on 1 March 2025).
27 *Viacom International Inc* v *YouTube Inc*, 676 F 3d 19 (2d Cir 2012) (US).
28 Google, An update to our search algorithms, https://search.googleblog.com/2012/08/an-update-to-our-search-algorithms.html (accessed on 1 March 2025).
29 Edit Salochin Group, What is Google Pirate?, https://edit.co.uk/blog/google-pirate-algorithm/ (accessed on 1 March 2025).
30 Google, Report content for legal reasons, https://support.google.com/legal/troubleshooter/1114905 (accessed on 1 March 2025).
31 Google, Transparency report: Sharing data that sheds light on how the policies and actions of governments and corporations affect privacy, security, and access to information, https://transparencyreport.google.com (accessed on 1 March 2025).
32 Husovec M, The promises of algorithmic copyright enforcement: takedown or staydown: which is superior: And why, *Columbia Journal of Law & The Arts*, 42 (1) (2018) 84.
33 Blevins J, Uncertainty as enforcement mechanism: The new expansion of secondary copyright liability to internet platforms, *Cardozo Law Review*, 34 (2013) 1830.
34 Zarsky T, Transparent predictions, *University of Illinois Law Review*, (2013) 1552.
35 Pasquale F, Restoring transparency to automated authority, *Journal of Telecommunication & High Technology Law*, 9 (2011) 246.
36 Sawyer M, Filters, fair use & feedback: User-generated content principles and the DMCA, *Berkeley Technology Law Journal*, 24 (2009) 382; Depoorter B & Walker R, Copyright false positives, *Notre Dame Law Review*, 89 (1) (2013) 326.
37 Shinn L, YouTube's Content ID as a case study of private copyright enforcement systems, *AIPLA Quarterly Journal*, 43 (2) (2015) 373.
38 *Lenz* v *Universal Music Corp*, 801 F 3d 1126 (9th Cir 2015) (US).
39 Gray J & Suzor N, Playing with machines: Using machine learning to understand automated copyright enforcement at scale, *Big Data & Society*, 7 (1) (2020) 3.
40 Carretta S, Liability for copyright infringement and algorithmic content moderation: A matter of proportion, *De Lege*, (2021) 240.
41 Urban J, Notice and takedown in everyday practice, *UC Berkeley Public Law Research Paper*, 2755628 (2017) 77.

42 Google, How Google Fights Piracy (Google, California), 2016.
43 Heald P, How notice-and-takedown regimes create markets for music on YouTube: An empirical study, *University of Missouri-Kansas City Law Review*, 83 (2014) 313.
44 Bar-Ziv S & Elkin-Koren N, Behind the scenes of online copyright enforcement: Empirical evidence on notice & takedown, *Connecticut Law Review*, 50 (2017) 339.
45 Urban J & Quilter L, Efficient process or chilling effects: Takedown notices under section 512 of the Digital Millennium Copyright Act, *Santa Clara Computer & High Technology Law Journal*, 22 (2006) 636.
46 Freeman J, The private role in public governance, *New York University Law Review*, 75 (2000) 574.
47 Perel M & Elkin-Koren N, Black box tinkering: Beyond disclosure in algorithmic enforcement, *Florida Law Review*, 69 (1) (2017) 181.
48 Lee E, Recognizing rights in real time: The role of Google in the EU right to be forgotten, *University of California Davis Law Review*, 49 (2016) 1055.
49 Benkler Y, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (Yale University Press, New Haven), 2006, p. 130; Elkin-Koren N, *User-generated platforms*, In: *Working Within the Boundaries of Intellectual Property* (Oxford University Press, Oxford), 2010, 114.
50 Citron D, Technological due process, *Washington University Law Review*, 85 (2008) 1297.