The Promises of Algorithmic Copyright Enforcement: Takedown or Staydown? Which is Superior? And Why?

Martin HUSOVEC[1]

Under the prevailing model of intermediary liability in the copyright law, right holders and intermediaries are both involved in the enforcement of the rights on the internet. While right holders are expected to identify and notify the infringing content that they wishes to remove, the intermediaries have to react by assessing the received notices and taking appropriate action, including to take the information 'down' from the service in case it is infringing. This 'notice and takedown' system, championed by the DMCA, became a model for many countries around the world. However, in the last few years, the right holders started advocating for the fundamental re-design of the system. According to the number of initiatives, some of the right holders would prefer that intermediaries not only take down the notified content but also prevent its re-appearance in the future. This model, often dubbed, 'notice and staydown', is now being even proposed by the European Commission within its Digital Single Market copyright proposal.

The article first explains the two enforcement models. Second, it provides in-depth rationalization of various policy-choices, including some fundamental enforcement economics, and explains how automation fits these debates. Third, it scrutinizes potential switch from notice and takedown policy (NTD) to notice and staydown policy (NSD) in order to answer two questions: (A) What are the costs and benefits of two policy options and how do they compare? (B) Is NSD really superior in delivering better tools for automation? After this examination, I finally conclude the following: In the area of copyright enforcement, (1) high-quality automation of copyright enforcement that produces negligible enforcement errors should be embraced and incentivized; however, (2) processing of algorithmically generated notices should be always conditional upon their quality; (3) standardized notice and takedown (NTD) framework can promote such automation better than notice and staydown (NSD) because (3a) it provides for stronger market incentives for the development of new filtering technologies and (3b) allows area-by-area deployment as the technologies improve; (4) as a consequence, standardized NTD can be (if exploited fully) a superior policy option from a social perspective exactly because it better embraces high-quality automation with lesser undesirable externalities.

[1] I would like to thank Sebastian Dengler, Daphne Keller, Maurice Schellekens and participants of TILT Work-in-progress seminars and TILEC Law & Economics 2017 Media Conference for discussions on the earlier draft of this paper. I would also like to thank Riyad Anwar for his research assistance.

Contents

1 INTRODUCTION

Sir Paul McCartney, Lady Gaga, Taylor Swift and U2 – those are just few out of almost 200 artists that recently urged the US Congress to revisit the existing notice and takedown policy in the copyright law. The proposal they endorse is often dubbed 'notice and staydown' (NSD).[2] One petition of artists formulated their plea to the Congress as follows:

> "Small independent film makers spend their time not making movies, but sending out 50,000 take down notices in a vain attempt to sweep aside the tide of recurrent copyright infringement. We need to change the laws to make sure that artists spend their time making art, not sending take down notices.
>
> It is time that a take down notice be sent once, and only once. Thereafter it should be the duty of the website to prevent the reposting of the same material. The technology to do this is available. What is lacking is the legal directive to use this technology to prevent the wholesale theft of artistic creations."[3]

In the European Union, the copyright holders are also pursuing similar agenda under the banner of so called 'value gap'. Value gap attacks notice and takedown from a different perspective. It does not complain about enforcement inefficiency of the system directly, but about the fact that it allows platforms to enjoy unlicensed content without paying royalties or gives them a superior bargaining position in case they show willingness to license on behalf of their users. As will be explained, the European Commission´s recent proposal for the copyright reform in the Digital Single Market adopts stay-down obligation against the background of these arguments.

The proposals in the United States and the European Union essentially try to achieve that intermediaries, and not the right holders, should be responsible for continuous identification of the infringing content. In the literature,[4] a number of objections were raised against NSD, including

---

[2] See U.S. Copyright Office, ´Section 512 Study: Notice and Request for Public Comment´, Library of Congress (Dec. 2015), available at <https://www.federalregister.gov/documents/2015/12/31/2015-32973/section-512-study-notice-and-request-for-public-comment#footnote-36-p81865>; Elliot Harmon, ´*Notice and Staydown is really Filtering Everything´*, Electronic Frontier Foundation (Jan. 21, 2016) available at <https://www.eff.org/deeplinks/2016/01/notice-and-stay-down-really-filter-everything>; Take Down and Stay Down Foundation, Take Down and Stay Down Petition (2015), available at <https://www.takedownstaydown.org/>.

[3] See Take Down and Stay Down Foundation, Take Down and Stay Down Petition (2015), available at <https://www.takedownstaydown.org/>

[4] For the debate see European Copyright Society, General Opinion on the EU Copyright Reform Package (2017), available at <https://europeancopyrightsocietydotorg.files.wordpress.com/2015/12/ecs-opinion-on-eu-copyright-reform-def.pdf>; See also Open Letter from Stalla-Bourdillon et al., on the Importance of Preserving the Consistency and Integrity and of the EU Acquis relating to Content Monitoring within the Information Society, to European Commission [hereinafter *'EC*] (Sep. 30, 2016), available at <https://ssrn.com/abstract=2850483> (against); Open Letter from CREATE, on the EU Copyright Reform Proposals for the Digital Age, to members of the European Parliament [hereinafter 'EP'] and the European Council (Feb. 24, 2017) available at <http://www.create.ac.uk/policy-responses/eu-copyright-reform/>;

that it disproportionately interferes with fundamental human rights. Naturally, if NSD is against human rights law, then it cannot be legislated at all, regardless of any efficiencies that might be gained. In this contribution, I do not enter this debate, but rather explore those claimed *efficiencies* offered by NSD. For the sake of the argument, I simply assume that NSD is permissible to legislate and look at the policy choice. In other words, the paper unpacks the often argued promises associated with the switch from NTD to NSD policy in order to see how strong and well-founded they are.

The article proceeds as follows. First, it explains the two enforcement models. Second, it provides in-depth rationalization of various policy-choices, including some fundamental enforcement economics, and explains how automation fits these debates. Third, it scrutinizes potential switch from notice and takedown policy (NTD) to notice and staydown policy (NSD) in order to answer two questions: (A) What are the costs and benefits of two policy options and how do they compare? (B) Is NSD really superior in delivering better tools for automation? And finally, it concludes.

1.1 Taxonomy of Enforcement Models

Under the today prevailing model of intermediary liability, right holders and intermediaries are both involved in the enforcement of the rights on the internet. While right holders are expected to identify and notify the infringing content that they wishe to remove, the intermediaries have to react by assessing the received notices and taking appropriate action, including to take the information 'down' from the service in case it is infringing. This 'notice and takedown' system, championed by the DMCA, became a model for many countries around the world.[5] However, in the last few years, the right holders started advocating for the fundamental re-design of the system. According to the number of initiatives, some of the right holders would prefer that intermediaries not only take down the notified content but also prevent its re-appearance in the future. Some countries, such as Germany, have been practicing similar model for the last couple of years in the shadow of the European harmonization. This model, often dubbed, 'notice and staydown', is now being proposed by the European Commission within its copyright reform package concerning the Digital Single Market.

The notice and takedown system (NTD) refers to a two-stage online enforcement process, where right holders are expected to identify and notify the content, and intermediaries to review notifications and act upon them if the content is unlawful. The system is a compromise between

---

For argument in favor see, Association Litteraire et Artistique internationale, 'Resolution on the European proposals of 14 September 2016 to introduce fairer sharing of the value when works and other protected material are made available by electronic means' (Feb. 18, 2017) available at <http://www.alai.org/en/assets/files/resolutions/170218-value-gap-en.pdf>.

[5] Digital Millennium Copyright Act of 1998, Pub. L. No. 105-304, 112 Stat. 2860 (codified as amended at 17 U.S.C. §§ 512, 1201–1205, 1301–1332 and 28 U.S.C. § 4001); Daniel Seng, *The State of the Discordant Union: An Empirical Analysis of DMCA Takedown Notices*, 18 Va. J. L. Tech. 369 369–473 (2013), at 375; Niva Elkin-Koren, *Fair Use by Design,* 64 UCLA L. Rev. 1082 (2017), at 1085

an effective system of enforcement of right holder's rights on one hand, and freedom of expression of users and platform's ability to innovate on the other. NTD surely is not the only possible allocation of responsibilities.

Alternatively to NTD, one can imagine systems with *strict liability*, under which intermediaries compensate right holders for any user-committed infringement, and *zero liability*, where any enforcement is left to voluntary action of an intermediary.[6] In addition, notice and takedown system itself can come in many alterations, such as with a formal conditions being imposed on a notice, mandatory takedown following fulfillment of formal conditions, conditional counter-notice, obligatory court-approved notification, etc.[7] These conditions greatly influence the design and outcomes of the system. Any NTD-based system can be hardly evaluated without taking these design-features into account as they constitute different versions of NTD.

Notice and staydown (NSD) is yet another alternative. Unlike NTD, it is not a continuous two-stage two-person process. In its typical form, it requires that right holders only send a single notification regarding a particular protected object (e.g. a copyrighted work), which then triggers a time-limited obligation to prevent re-infringing of the same object. However, even the NSD can have variations. In my understanding, unlike so called 'repeat infringer' obligations, which demand termination of access or accounts of repeated offenders, NSD, as a model, always requires prevention of wrongdoing irrespective of who the infringer is. In other words, it does not limit preventive obligation to the same perpetrator. Depending on the scope of preventive 'stay-down' obligation, it might require an intermediary to protect from re-infringing only (1) in the same form (e.g. re-uploading of the same file), or (2) in any form (e.g. re-uploading an infringing part instead of full-scale copying). I assume that the NSD would usually mean the latter. What I do not view as notice and stay-down in this paper, on the other hand, is when an obligation to prevent is imposed without requiring a single notice to be send. Such liability scheme, in my view, and also economically speaking, equals to pure strict liability, while notice and staydown can be, under some conditions, still perceived as a rule of negligence.[8]

---

[6] Under *Canadian Copyright Act [§ 41.25, 41.26, and 41.27(3)]*, Canadian Internet service providers and internet storage service providers are not required to remove or disable infringing content, although they may do so voluntarily, and a copyright owner will still be required to invoke other legal remedies. See Borden L. Gervais, *Canada's New Notice and Notice Regime for Internet Copyright Infringement* (Nov. 8, 2014), <http://blg.com/en/News-And-Publications/Publication_3883>.

[7] *See* also taxonomy used by Angelopoulos and Smet: Christina Angelopoulos and Stijn Smet, *Notice-and-fair-balance: how to reach a compromise between fundamental rights in European intermediary liability*, 8 J. MEDIA LAW 266–301 (2016).

[8] See also: Giancarlo Frosio, *The Death of 'No Monitoring Obligations': A Story of Untameable Monsters*, 8(3) J. INTELLECTUAL PROPOPERTY, INFORMATION TECHNOLOGY AND E-COMMERCE LAW (JIPITEC) 212-215 (2017); Giancarlo Frosio, *From Horizontal to Vertical: An Intermediary Liability Earthquake in Europe*, 12 OXFORD JOURNAL OF INTELLECTUAL PROPERTY LAW AND PRACTICE 565-575 (2017) (discussing shift from negligence to strict liability regime; in my view, strict liability is not automatically a consequence of adopting NSD)

1.2 NOTICE AND TAKEDOWN

Most of the legislative regimes of intermediary liability today, such as the American DMCA, European E-Commerce Directive and Chinese Tort Law[9], follow broadly defined notice and takedown model of online enforcement. This means that right holders are expected to identify and notify, while intermediaries to evaluate and act upon notifications. The models differ in many respects, so they often represent more different versions of NTD.

In the European Union, the E-Commerce Directive does not mandate a single system because, within some boundaries, it allows the Member States to come up with their own procedures. In the United States, on the other hand, the federal law prescribes each step of the notification and takedown process in a fairly detailed manner. One of the crucial differences between two versions of NTD is that while the US version requires takedown following fulfilment of some formal requirements, the European system, at least on the Union level, does not prescribe any action. It only incentivizes takedown by lifting the safe harbours immunities and exposing to domestic tort laws.

When comparing these two regimes and Chinese NTD systems, number of differences can be observed. The US and Chinese systems codify the procedure, requiring fulfillment of particular elements, while European Union framework leaves it to the Member States if they do so. Most of them do not specify such procedures.[10] The US and Chinese systems both acknowledge counter-notice procedure, while the EU system does not. Some of the EU member states, however, include it nevertheless in its statutory frameworks.[11] In China, NTD does not require the assessment of whether the complained materials are actually infringing or not.[12] The systems also define the reaction windows differently. While the EU system relies on a general notion of an 'diligent economic operator',[13] Chinese NTD interprets 'immediate removal' through a case-by-case basis the factors such as: method in sending the notice; the accuracy of the notice; amount of infringing contents indicated by the notice; difficulty in removing contents or disabling access on the contents; characteristics of the ISP. These factors are open-ended and depend on the state of technology.[14] In terms of compensation for the wrongful request, the US system is the most

---

[9] See Digital Millennium Copyright Act of 1998, Pub. L. No. 105-304, 112 Stat. 2860 [US]; Directive 2000/31/EC on E-Commerce Directive on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market [hereinafter *'E-Commerce Directive'*], Jun. 8, 2000, Art. 12-5 [EU]; Tort Law of the People's Republic of China, Dec. 26, 2010, Art. 36 [China]; The US include safe harbors regularly into BTAs – *see* the overview compiled by Seng. Seng, *supra* note 5, at 373;

[10] Gerald Spindler, Giovanni Maria Riccio and Aurelie Van der Perre, Study on the Liability of Internet Intermediaries (2007) available at <http://ec.europa.eu/internal_market/e-commerce/docs/study/liability/final_report_en.pdf>

[11] *Id.*

[12] Jie Wang, *Regulating Hosting ISPs' Responsibilities for Copyright Infringement The Freedom to Operate in the US, EU and China* (2018) at 141 ff

[13] Court of Justice of the European Union, Case C-324/09 (2011) *L'Oréal and Others*, para 124

[14] See Wang, *supra* note 12

explicit. In the EU, such liability can be usually also derived according to the Member states laws, but seems rarely practiced. On the other hand, Chinese laws explicitly foresees also an obligation to compensate users when copyright holder's request leads to a wrongfully removal of the material thereby causing it damage.[15]

Moreover, two versions of NTD also operate in a different external environment. In the literature, any voluntary enforcement methods which are implemented by the intermediaries and go beyond the DMCA safe harbours, are referred to as 'DMCA-plus measures'.[16] Unlike in the United States, where such measures are entirely voluntary, in the European Union, some of the measures can be forced upon intermediaries by means of injunctions.[17]

In the most typical scenario, if intermediaries receive a notification about an alleged infringement by a user, they generally have to act expeditiously to remove the content; otherwise, they can face liability of their own. In practice, there are number of important dynamics. First of all, notice submitters, e.g. music right holders, and their authorized enforcement agents may or may not engage in sufficient quality control of what they notify. After their submission, all the notices are processed by the intermediaries; the extent and method of review is their choice.[18] Theoretically, intermediaries could still completely limit the effects of over-notification by engaging in a thorough review of notices, thus taking down only infringing content. However, to evaluate each submitted notice, an intermediary has to first assess its legality and relevant facts, which is costly and often leads to uncertain outcomes. Moreover, intermediaries are risk-averse and evaluate notices with extreme caution because under-compliance can be punished by severe fines or a form of joint liability. The law thus creates strong incentives for over-blocking of legitimate content by rational profit-maximizing entities.[19] The entire ecosystem could be, in theory, still 'saved' by concerned users who diligently counter-notify once their content is removed. However, according to the empirical research, this is not happening.[20]

One of the big problems of notice and takedown system is that its daily practice takes place entirely behind the closed doors.[21] Although number of providers in the last years started publishing so

---

[15] *Id.*

[16] Jennifer Urban, Joe Karaganis and Brianna Schofield, *Notice and Takedown in Everyday Practice*, (2016) UC Berkeley Public Law Research Paper No. 2755628, at 29, available at <https://ssrn.com/abstract=2755628>.

[17] See Martin Husovec, *INJUNCTIONS AGAINST INTERMEDIARIES IN THE EUROPEAN UNION: ACCOUNTABLE BUT NOT LIABLE?* (2017)

[18] See Martin Husovec, *Accountable, Not Liable: Injunctions Against Intermediaries*, (2016) TILEC Discussion Paper No. 2016-012, at 14 ff, available at < https://ssrn.com/abstract=2773768>

[19] *Id.*

[20] *Id.,* at 12; Annemarie Bridy and Daphne Keller, *U.S. copyright office section 512 study: Comments in response to second notice of inquiry*, (2015) available at <https://ssrn.com/abstract=2757197>

[21] See Maayan Perel (Filmar) and Niva Elkin-Koren, *Black Box Tinkering: Beyond Disclosure in Algorithmic Enforcement*, 69 FLA. LAW REV. 181–221 (2017); See also Rob Kitchin, *Thinking critically about and researching algorithms Thinking critically about and researching algorithms*, 4462 INFORMATION, COMMUN. SOC. 14–29 (2016).

called 'transparency reports',[22] these usually provide only aggregate data, which illustrate maybe scale of the NTD system, but say nothing about its usefulness or social desirability. The Lumen Project was conceived as a response to this problem. The project collects requests to remove material from the web and makes the tool freely available to anyone. In its effort, it relies on voluntary participation of providers. Its biggest partner so far has been Google, although, with respect to only some of its services. Any study of the notice and takedown in action thus has to rely on few available methods: (1) interviewing stakeholders;[23] (2) experimental upload and subsequent notification of own content,[24] (3) analysis of the Lumen data[25] and (4) tracking of public data sets.[26]

According to the existing studies, the notification landscape is dominated by corporations and businesses. In Urban and Quilter (2006) study, corporations and business entities were the primary users of the system. From the sample 94% of notices sent to mere conduits (Section A), 72% to hosting providers (Section C) and 79% to information location tool providers (Section D).[27] Among the professional users of the system, the music industry is a dominant player. Seng (2013) finds that BPI, IFPI and RIAA account for 58.6% of all notices served from 2008 and 2012 in his sample. To contrast this, he finds the adult entertainment industry produces 19.8% and movie industry sends 9.5% of the total number of notices. If notice numbers were used as a proxy for measuring enforcement activity, we could conclude that 6 out of 10 notices from the top 50 content providers pertain to music infringement.[28] Moreover, the ecosystem is changing in the important ways over time. It is becoming increasingly dominated by enforcement agents.

While in 2006, Urban and Quilter study found that an absolute majority of the notifications were still sent *directly* by right holders (94 % for hosting providers and 98.5% for information location tools),[29] more recent studies find the notification landscape has professionalized, with most of the work being done by enforcement agents. This includes specialized right enforcement

---

[22] Twitter, Twitter Transparency Report (January – June 2017), available at <https://transparency.twitter.com/en/copyright-notices.html#copyright-notices-jan-jun-2017>; Tumblr, Copyright and Trademark Transparency Report (2015), available at <http://static.tumblr.com/zyubucd/0uWntp2iw/iptransparencyreport2015a_updatedfinal.pdf>; GitHub's Transparency Report (2014), <https://github.com/blog/1987-github-s-2014-transparency-report>

[23] Urban et al., *supra* note 16.

[24] Scott Smitelli, *Fun with YouTube's Audio Content ID System,* Scott Smittelli (Apr. 21, 2010), available at <http://www.scottsmitelli.com/articles/youtube-audio-content-id>; See also Perel and Elkin-Koren (2017), *supra* note 21; Rob Kitchin, *Thinking critically about and researching algorithms Thinking critically about and researching algorithms*, 4462 INFORMATION, COMMUN. SOC. 14–29 (2016).

[25] *Id*. at 9; Seng, *supra* note 5; For a study on Chilling Effects repository (previously known as Lumen database) see Jennifer M. Urban and Laura Quilter, *Efficient Process or Chilling Effects? Takedown notices under Section 512 of the Digital Millennium Copyright Act*, 22 ST. CL. COMPUT. HIGH TECH. L.J. 621–693 (2006).

[26] See for instance: Kristofer Erickson and Martin Kretschmer, *This Video is Unavailable: Analyzing Copyright Takedown of User-Generated Content on YouTube,* 9(1) J. INTELLECTUAL PROPOPERTY, INFORMATION TECHNOLOGY AND E-COMMERCE LAW (JIPITEC) 75-89 (2018)

[27] Urban and Quilter, *supra* note 25, at 649.

[28] Seng, *supra* note 5, at 394.

[29] Urban and Quilter, *supra* note 25, at 655.

organizations, trade associations and marginally also law firms.[30] Urban and others find in their 2016 study that 91.8% takedown notices were sent by reporting agents with only 7.5% coming directly from the rights holders.[31] Similarly, Seng finds that while reporting agents constituted 36.8% in 2008 in his sample, it increased to 59.6% by 2012, focusing on top thirty reporters.[32] Of this group, only 5.3% of notices were sent by individuals directly.

At the same time, the automation is taking over the notice submission process. In Urban et al. (2016) study, 98.9% of the takedown requests in the sample were submitted using an automated Google notice submission form and almost entirely from Google's partnership program (TCRP), which allows members to submit large volume of requests.[33] On the other hand, automation is not yet used by everyone in the enforcement chain. All the above aspects influence the fact that NTD is increasingly becoming a tool relying on automated processes carried out by repeat players who specialize in the enforcement process on behalf of businesses.

1.3 Notice and Staydown

At the moment, Germany is closest to the notice and staydown model. In this jurisdiction, hosting providers are obliged, upon receiving a notice, not only to take-down the notified content, but also to prevent its further reappearance. This is an outcome of application of the domestic doctrine of injunctions, including against non-infringing actors, known as 'Störerhaftung'.

The filtering obligations started in Germany in 2004 with the Federal Supreme Court´s *Internetversteigerung I.* judgement.[34] According to the decision, the hosting providers can qualify as so called 'disturbers' and thus be held accountable for injunctions, irrespective of their liability in tort. Such accountability does not impose an obligation to review the content of entries prior any notification because this would disturb the business model of the platform. However, the platform operator must block any 'clear infringements' which are pointed out. In addition, it must take proactive steps to prevent infringements of a 'similar kind' from occurring again. The court explicitly suggested use of filtering software for this purposes. In the later sequel to the case,[35] it was ruled that a platform should implement filtering software that would flag objectively suspicious offers (e.g. due to their low price for a certain keyword) which could subsequently be reviewed manually by the employees. It was observed that the limit of reasonableness would certainly be reached if there are no other keywords for the filter. The platform operator, however, should block the offers only if they constitute instances of 'clear infringement'. These two auction platform cases imposed the first filtering obligations. In the years to come, the main focus of the

[30] Urban et al., *supra* note 16, at 84.
[31] *Id*. at 397.
[32] Seng, *supra* note 5, at 396.
[33] Urban et al., *supra* note 16, at 82.
[34] BGH *Internetversteigerung I.* (2004) I ZR 304/01.
[35] BGH *Internetversteigerung II.* (2007) I ZR 35/04.

cases were these filtering obligations of platforms, such as auction platforms[36] and file-sharing platforms,[37] but also re-publishers of RSS feeds,[38] blogging platforms,[39] and domain name parking companies.[40]

In a typical scenario, an intermediary receives a notification regarding a particular infringement. It is obliged to take the content down if wrongful, and further take reasonable efforts to prevent its reappearance. However, this proactive stay-down obligation is not limited to identical content from identical user (double identity), but extends also to infringements of 'similar kind' of the same work/sign,[41] even if infringing content reappears only in part,[42] regardless by whom it is posted.[43] One notification is thus enough to create this stay-down obligation for a particular protected subject matter.[44] The extent of 'technically and commercially reasonable' measures to prevent reappearance depends on many factors, including active role and nature of the posed risk by the platform.[45]

The courts already ruled that some hosting providers may be required to (1) employ word-filtering technology for the name of the notified work, including on existing uploads,[46] (2) use better than basic fingerprinting technology that only detects identical files, such as MD5,[47] as a supplementary tool, (3) manually check external websites for the infringing links associated with the notified name of a work on services like Google, Facebook and Twitter or (4) use web-crawlers to detect other links on own service. According to the Court's argument, this last proactive measure is more reasonable than to manually review the files that were not caught by the word-filter.[48] The obligation thus includes not only use of automated staydown solutions, such as filters, but also internal and external checks.

---

[36] *Internetversteigerung I* (2004) I ZR 304/01; BGH *Kinderhochstühle im Internet II.* (2013) I ZR 216/11; BGH *Kinderhochstuehle im Internet I.* (2010) I ZR 139/08

[37] BGH (2013) I ZR 79/12; BGH *File-Hosting-Dienst* (2013) I ZR 80/12; BGH (2013) I ZR 79/12; BGH *Alone in the Dark* (2012) I ZR 18/11

[38] BGH *RSS-Feed* (2012) VI ZR 144/11

[39] The operator of a blogging platform does not have to review the content a priori, but must only act upon a notice. The notice, however, must, without need of detailed factual and legal check, enable the platform provider to establish the wrongfulness of objected content. If such notice is received, the provide must not only remove the objected content, but also take reasonable measure to prevent its reappearance. See BGH *Blogger* (2011) VI ZR 93/10, at 22, 24, and 26.

[40] BGH *Sedo* (2010) I ZR 155/09

[41] BGH *Internetversteigerung I.* (2004) I ZR 304/01

[42] BGH (2013) I ZR 79/12, at 55

[43] *Id.*, at para 45; BGH *Alone in the Dark* (2012) I ZR 18/11 (tenor)

[44] BGH (2013) I ZR 79/12, at 58

[45] *Id.*, at para 20; BGH *File-Hosting-Dienst* (2013) I ZR 80/12, para 15; BGH *Kinderhochstühle im Internet II*. (2013) I ZR 216/11, at 48

[46] BGH *Alone in the Dark* (2012) I ZR 18/11

[47] BGH *File-Hosting-Dienst* (2013) I ZR 80/12, para 58; BGH (2013) I ZR 79/12, at 46

[48] BGH *Alone in the Dark* (2012) I ZR 18/11, 39; BGH (2013) I ZR 79/12, at 53

In August 2016, the European Commission's plans for the copyright reform were leaked, including its proposal for the Directive on Copyright in the Digital Single Market.[49] The newly proposed rules plan to substantially revise existing intermediary liability rules for the copyright and related rights. Article 13(1) of the Proposal essentially comes up with a mandatory notice and staydown regime for all the platforms that 'store and provide to the public access to large amounts of works or other subject-matter uploaded by their users'.[50] In August 2017, the Estonian Presidency of the EU proposed two compromise versions, both of which include staydown as the policy choice.[51] This time, it should apply to every platform that 'stores and provides access to the public to a significant amount of copyright protected works or other subject-matter uploaded by their users who do not hold the relevant rights in the content uploaded'.[52] The legislative process is still ongoing.

All three proposals are attempting to establish a new stand-alone obligation to prevent third party infringement, independent of exclusive rights. It will be a copyright-related obligation, but its infringement can hardly be seen as copyright infringement. The sanctioning of this obligation will be left to the Member States which means additional fragmentation. As a consequence, the staydown obligation might be enforced by administrative fines in one country and private claims in the other. In all these proposals, staydown policy is worded as a market-entry obligation to 'prevent the availability on their services of works or other subject-matter identified by rightholders', including by content recognition technologies.[53] All the proposals seem to aim for

---

[49] Proposal for a Directive of the European Parliament and of the Council on copyright in the Digital Single Market [Hereinafter "*Proposal of DSM Directive*"], Sep. 14, 2016, COM(2016)593, available at: <https://ec.europa.eu/digital-single-market/en/news/proposal-directive-european-parliament-and-council-copyright-digital-single-market>.

[50] It reads: "Information society service providers that store and provide to the public access to large amounts of works or other subject-matter uploaded by their users shall, in cooperation with rightholders, take measures to ensure the functioning of agreements concluded with rightholders for the use of their works or other subject-matter or to prevent the availability on their services of works or other subject-matter identified by rightholders through the cooperation with the service providers. Those measures, such as the use of effective content recognition technologies, shall be appropriate and proportionate. The service providers shall provide rightholders with adequate information on the functioning and the deployment of the measures, as well as, when relevant, adequate reporting on the recognition and use of the works and other subject-matter." See Proposal on DSM Directive, *supra* note 49, Art. 13; See also Martin Husovec, *EC Proposes Stay-down and Expanded Obligation to Licenses UGC services*, Hutko's Technology Law Blog (Sept. 1, 2016), <http://www.husovec.eu/2016/09/ec-proposes-stay-down-expanded.html>.

[51] Martin Husovec, *Compromising (on) the Digital Single Market? A Quick Look at the Estonian Presidency Proposal(s) on Art. 13*, Kluwer Copyright Blog (Sept. 8, 2017), <http://copyrightblog.kluweriplaw.com/2017/09/08/compromising-digital-single-market-quick-look-estonian-presidency-proposals-art-13/>.

[52] Proposal on DSM Directive, *supra* note 49, Art. 13.

[53] The Europe Council affirmed that the "collaboration between information service providers and providing access to public to large amounts of copyright protected works… is essential for the functioning of technologies, such as content recognition technologies". See *Id*. Recital 39; In turn, The European Commission defines market entry obligations as "*those measures, such as the use of effective content recognition technologies*". *Id*. Art. 13.

German style preventive measures that reduce infringements irrespective of who is committing the act of infringement, although this is not completely clear from the wording. Moreover, the obligation would apply not only to copyrighted works, but also to neighbouring rights, such as rights of broadcasters, performing artists, phonogram producers and, potentially, publishers.[54] This means that even copyright-related rights, such as neighboring rights, which often do not have to meet an objective standard of protection like originality will be protected in this way. This makes measures even more difficult to apply.

2 ENFORCEMENT ECONOMICS

American DMCA, European E-Commerce Directive and Chinese Tort Law,[55] incorporate similar forms[56] of *statutory negligence standard*, in L&E literature also called negligence *per se*.[57] The services such as the hosting of third party information, the provision of information location tools or similar services[58] are often subject to liability only upon obtaining knowledge either from notice, and/or other sources. Under such a system, responsibilities are placed on the shoulders of both right holders and intermediaries. The former should assist by identifying the infringing content and the latter by examining requests and taking the content down if necessary. This two-stage two-person process can be well-explained by the negligence rule of so called joint-care scenarios. The rule of negligence aims at setting socially efficient (optimal) levels of care. Economic analysis uses the so-called Learned Hand formula as the basis of the model for optimal care. All the *intermediaries* or *right holders* taking less than optimal care-levels (B < PL) are liable for the harm they cause. The *optimal level of care* should not be higher than the harm (L) multiplied by the

[54] The Proposal does not include any definition of this term. However, looking at the InfoSoc Directive, it is clear which some of those rights are in the copyright context. Directive 2001/29/EC on the harmonization of certain aspects of copyright and related rights in the information society [hereinafter 'InfoSoc Directive'], May 22, 2001, Art. 3(2).

[55] Supra *note* 9.

[56] Landes and Lichtman discuss the negligence standard of DMCA safe harbors. William M. Landes and Douglas Lichtman, '*Indirect Liability for Copyright Infringement: An Economic Perspective* (2003) 16 Harvard Journal of Law and Technology 395, at 405; Lemley describe European approach as negligence based. Mark A. Lemley, '*Rationalizing Internet Safe Harbors*' (2007) 6 Journal of Telecommunications and High Technology Law 101, at 118; For discussion on safe harbors and fault-based liability, see Jonina S. Larusdottir, '*Liability of Intermediaries for Copyright Infringement*' (Stockholm Institute for Scandianvian Law paper 2010), at 476; Mann and Belzley held that "the existing liability regimes, which are largely fault-based". Ronald J. Mann and Seth R. Belzley, *'The Promise of Internet Intermediary Liability*' (2005) 47 William & Mary Law Review 239, at 250.

[57] ROBERT COOTER AND ARIEL PORAT, GETTING INCENTIVES RIGHT: IMPROVING TORTS, CONTRACTS, AND RESTITUTION GETTING INCENTIVES RIGHT: IMPROVING TORTS, CONTRACTS, AND RESTITUTION (2014), at 6.

[58] BGH *Autocomplete* (2013) VI ZR 269/12 (Google suggestion tool is liable only upon notice); Paula Vargas, '*Argentine Supreme Court Decides Landmark Intermediary Liability Case*', *Stanford CIS Blog* (Nov. 5, 2014), <https://cyberlaw.stanford.edu/blog/2014/11/argentine-supreme-court-decides-landmark-intermediary-liability-case>.

probability of such harm (P). If damage is multilateral and both parties exercise optimal care-levels, the negligence rule allocates the residual loss where it fell. In the context of infringement of intellectual property rights on the Internet, it is the right holder who bears the residual loss. The Learned Hand formula must always be applied in its marginal form by measuring the costs (B) and benefits of incremental improvements in safety (PL) to yield efficient results.[59] If care taken is not optimal (B < PL), the negligent party will bear the resulting harm (L).

2.1 NTD & NSD AS NEGLIGENCE STANDARD

Intermediaries process countless numbers of postings of their users. Even small start-ups can usually take pride in impressive numbers, which no team of humans would ever be able to pre-moderate. This automated processing of information makes computing a sweeping change for society and is at the heart of the digital revolution. Some of this data, however, carries infringements of intellectual property rights, which take various forms. Some of them are easy to establish without the assistance of right holders, others are more difficult or even impossible. The need to *identify* the protected content in the sheer volume and the subsequent need to *determine* its status thus inflate the otherwise low burden of the intermediaries.[60] Intermediaries would be required not only to inspect its content, flag suspicious posts and then proceed to its evaluation, but also to pro-actively collect information about *all* existing protected objects. Two basic costs are inevitably shaping the legal framework this direction. These are the costs of determining IP ownership, including costs of legality of use, and costs of understanding right holder's licensing arrangements.

First, there are literally millions of potential rights holders with a vast amount of protected objects that can be misused on-line. For copyrighted works, intermediaries lack *comprehensive reference databases* even if they were to completely take over all the enforcement efforts. This private information of right holders about ownership of rights constitutes a cost for intermediaries. It makes an action in pre-notification phase an impossible task. It is also the reason why notice and staydown model still relies on the first-notification by the right holders. Such notification reduces or eliminates the cost of determining the IP rights.

Second, in the pre-notification phase, an intermediary has no means of knowing whether the content that is technically an infringement is not licensed to a third party for such a use, put on-line directly by the right holder, with his simple consent, or just purposefully tolerated or even encouraged by the right holder for business reasons. The intermediary would thus need to collect private information not only about ownership, but also concerning the entire licensing strategy and map of licensing arrangements of all the right holders in the world. In the stay-down model,

---

[59] If the formula is 10 < 100, it is still possible that 11 < 20 and that 12 > 5, as the relationship does not have to be linear. RICHARD POSNER, ECONOMIC ANALYSIS OF LAW (Aspen Publishers, 2003) at 168

[60] Landes and Litchman note that it "prohibitively expensive to distinguish legal from illegal copyright activity". William M. Landes and Douglas Lichtman, *supra* note 56, at 404-5.

the first notification is meant to communicate the default position of the right holder, which is to block the content, irrespective of the user or use.[61]

As a consequence of the above circumstances, *before notification*, the costs of intervening to remove the content are generally higher than the expected harm (B>PL), so no obligation to intervene would usually arise.[62] Unless the current form of defining, granting and managing copyright were somehow simplified and publicly recorded, a large proportion of this information will not be readily available at zero costs. *Pre-notification costs* would thus for most types of infringements remain prohibitive.[63]

Right holders are in a better position to identify various types of infringements. In multilateral care scenarios, a certain level of care is expected from *both parties* under the negligence rule. Right holders fulfill their part by assisting in the identification and determination of illegal content.[64] In fact, when it comes to establishing ownership and its status, right holders can act more cheaply, since they have best knowledge of what is protected, who licensed the content from them or if they themselves acted as users, whether certain uses lead to any harm on their side or whether they wish to tolerate user generated content for business reasons even if it is technically infringing.[65] In other words, right holders know best what they own, what harms them and who has their permission. Such knowledge cannot be simply assumed in any cost benefit analysis.

Submission of notices by right holders exponentially reduces the burden of intermediaries (B) and thus their obligation to intervene is triggered (B<PL).[66] They are now supplied with more private information as well as location of the infringing files. If the law allows, intermediaries can also clear doubts about the content with their users. This assumes, however, that the legal framework does not discourage such a dialogue. Systems of counter-notices that encourage users to oppose

---

[61] One can imagine, however, that more granular stay-down notification regarding the context would be possible as well.

[62] Matthew Schruers, *The History and Economics of ISP Liability for Third Party Content,* 88 VIR. L. R. (2002) 205, at 234.

[63] Lemley views the assessment on illegality ex ante, or before notice, is difficult, if not impossible. Mark A. Lemley, *Rationalizing Internet Safe Harbors*, 6 Journal of Telecommunications and High Technology Law (2007) 101, at 111; See also *Id.* at 234.

[64] Not exercising this diligence on their side could then lead to comparative negligence.

[65] For instance, FreemantleMedia, the production group behind The X-Factor and Britain's Got Talent, tolerates infringement by users who use clips uploaded by them to drive audience interest in its programs - *see* Editorial, '*YouTube Handed Out $1 Billion in Ad Money Thanks to Content ID*', Softpedia (Oct. 14, 2014), <http://news.softpedia.com/news/YouTube-Handed-Out-1-Billion-In-Ad-Money-Thanks-to-Content-ID-462088.shtml> (accessed Nov. 19, 2014).

[66] Schruers, *supra* note 62, at 205.

erroneously notified content actually assist *right holders* in reducing the margin of error of their submissions.[67]

Although costs of establishing IP ownership and licensing legitimatize some form of notification, they cannot be seen as immediate endorsement of notice and takedown. To the contrary, notice and staydown, as a policy, essentially also seems to acknowledge that right holders are best-placed to identify their protected content. They differ in how the post-notification enforcement should be structured. Both policies seem to recognize that any optimal enforcement is not possible without right holders doing their part. The interest of one right holder does not always match the interests of others. Consider examples of fan fiction sites or video game streaming platforms. Both may technically qualify for an infringement of copyright. Some right holders might oppose them, but others even encourage them. It depends on the business models or strategies of a particular right holder. One uniform enforcement imposed by a platform such as pre-filtering of all content, even if possible, might not be beneficial to all the right holders. The first-notification allows right holders to signal their own preferences. Therefore, the main disagreement between NTD and NSD seems to lie elsewhere, namely in how post-notification enforcement should look like.

2.2 A-Types and NYA-Types

Stay-down attempts to oblige intermediaries to prevent infringements that are identical or similar to previous ones, assuming that the first notification *always* makes it easier to automatically identify and determine the subsequent infringement. However, only infringements that can be automated have this property. The only advantage the repeated submissions has for all other infringements is that they help to establish a *reference database* for objects that might be infringed upon (if accompanied with finger-print data) and indicates the right holders preferences to enforce. But the sole fact that something is repeated can change little about the possibility of automating the evaluation process. The capabilities of automation are dependent on the state of technological development, such as of artificial intelligence. Only if technologies are accurate in their evaluation with only negligible rate of false positives similar to those associated with expert human judgment, we can speak of automatable types of infringements (A-Types). Once infringements become A-Types, use of automation is hardly objectionable as its social costs is not higher than under human-implemented NTD. On the other hand, when automation is forced upon any other, not-yet-automatable infringements (NYA-Types), the social cost of enforcement is higher because the technology creates a unique over-blocking harm by its non-negligible rate of false positives.

[67] Accordingly, notification could become a tool against misalignment of incentives of ISPs and users. Urban and Quilter also speak in favor of take-down after notice and right to reply have been initiated. Urban and Quilter, *supra* note 25, at 689.

In the social sciences, there is a mounting literature showing that in the battle of human vs algorithm, human can lose.[68] Daniel Kahneman points out that even if the domain characteristic for a great uncertainty algorithms can outperform humans. The areas of such demonstration include prediction of the longevity of cancer patients, the length of hospital stays, the diagnosis of cardiac disease, and the susceptibility of babies to sudden infant death syndrome, the evaluation of credit risks by banks, the future career satisfaction of workers, the assessments of the suitability of foster parents, the odds of recidivism among juvenile offenders, the likelihood of violent behavior, the evaluation of scientific presentations, the winners of football games, and the future prices of Bordeaux wine.[69] There is no reason why we should think that predicting founding of IP infringements should be less susceptible to automation. Unless algorithms are not better than trained human experts, automation could still help as an aid to human judgment (semi-automation).

In the copyright literature, in particular the question of automation of the fair-use assessment (or fair use by design) is increasingly receiving attention. Elkin-Koren argues that we should embrace that fair use becomes coded into technological solutions.[70] Others are of the view that algorithms are not or will be never be in a position to adjudicate such delicate questions.[71] It is possible that high-quality automation which achieves negligible margin of error will remain workable only with respect to some instances of infringements, protected subject matter or parts of the evaluation process. Evaluation of some elements might remain too contextual to ever be fully automated.[72] In any case, for the purposes of this article, it is not pressing to know what the actual ratio of A-Types and NYA-Types is or will be in the future. It is more important to recognize the existence of the two categories as they affect the socio-economic analysis. The question whether AI once significantly pushes the ratio towards A-Types and thus completely erases contextual concerns is important, but analytically less crucial, as I will try to show.

The often-repeated argument in favor of staydown is that it better solves a so called ´whack-a-mole´ problem of the online enforcement. It is suggested that notification of the online content is akin to a game in an amusment arcade in which players use a mallet to hit toy moles, which appear

---

[68] Meehl claimed that data-driven algorithms can better predict human behavior better than trained clinical psychologists. See PAUL E MEEHL, CLINICAL VERSUS STATISTICAL PREDICTION: A THEORETICAL ANALYSIS AND A REVIEW OF THE EVIDENCE (Leslie J. Yonce ed., 1st ed. 1954), at 60; See also DANIEL KAHNEMAN, THINKING, FAST AND SLOW (Farrar, Straus, and Grioux, 2011), at 223 & 465.

[69] Kahneman, *supra* 68, at 223.

[70] Elkin-Koren, *supra* 5, at 14 ff.

[71] Mark A. Lemley, Rationalizing Internet Safe Harbors, 6 J. ON TELECOMM. & HIGH TECH.L. 101, 110–11 (2007); Dan L. Burk & Julie E. Cohen, Fair Use Infrastructure for Rights Management Systems, 15 HARV. J.L. & TECH. 41, 56 (2001); Edward W. Felten, A Skeptical View of DRM and Fair Use, COMM. ACM, Apr. 2003, at 57, 58.

[72] Though some patent offices are trying to push the boundaries of automation by employing artificial intelligence already in the registration process: AIbussiness, *The Japan Patent Office Deploying AI to Screen Patent Application* (2017), <https://aibusiness.com/japan-patent-office-deploying-ai-screen-patent-application/> (accessed Dec. 1, 2017).

at random, back into their holes.[73] This analogy compares online enforcement via notice and takedown to a situation in which attempts to solve a problem are piecemeal or superficial, resulting only in temporary or minor improvement.[74] Moreover, the argument is that if the intermediaries are obliged to prevent the publication of the third party infringing content, the harm would be prevented before it can be caused by going online.

However, it is questionable if 'whack-a-mole' metaphor captures the main challenges in the dynamicism of today´s online enforcement. According to some empirical research, it seems that the most significant problem is that NTD, under the existing resource restrains,[75] cannot be sufficiently scaled up to target all or even most of the content. The notice and take-down seems to work well for what is notified (safe for some instances of live-streaming), by making the notified content short-lived. However, the problem is the content which is never notified and goes unnoticed. Its life-expectancy is surprisingly long and usually terminated by the services themselves and not right holders.[76] If this observation applies in general to the infringing ecosystem, then the online enforcement has rather a problem of scale. It would suggest that if all the content could be spotted by right holders and notified quickly enough, NTD would assure its fast removal and thus avoid most of the harm. The scalability of enforcement is intertwined with automation. There can be only as much scalability as much technology allows. Human review can never cope with the volume of internet content without fundamentally changing its current architecture.

Applications such as YouTube, eBay, DropBox, Facebook, cyberlockers, advertisement providers, search engines and web forums are involved in intermediating content; whether it is actual files, web-streams, hyper-links or other references such as search results or magnet links. Where automation is possible after the first notification, the costs of re-detection of the content is lowered not only for the *notified* content, but also for its A-Types. This could be an argument in favor of continuous obligation to prevent re-appearance of the content whose detection can be automated (B<PL), while keeping social costs constant. As long as costs of using automation per notice (B) is lower than the notified expected harm (PL), the obligation to filter such content is triggered. Since I defined the A-Types as those which are subject to high-quality automation with negligible rate of false positives, the social cost (SC) is not worsened compared to NTD. It could be even improved relative to NTD ($SC_{NSD} \leq SC_{NTD}$) because automation can be also superior to human

---

[73] See Oxford Living Dictionaries, Definition of "Whack-a-mole", <https://en.oxforddictionaries.com/definition/us/whack-a-mole> (accessed Dec. 1, 2017)

[74] *Id.*

[75] Lauinger et al. reported that for most of the file hosting platforms studied, more than half of the links survive for at least 30 days, even though they are all infringing; on the other hand, up to 40% of the content is blocked within five days. See Tobias Lauinger et al., *Clickonomics: Determining the Effect of Anti-Piracy Measures for One-Click Hosting*, *in* NDSS SYMPOSIUM 1–14 (2013), available at: <http://iseclab.org/publications.html$%5C$npapers3://publication/uuid/66860951-122B-443E-9720-992BC512D8C9>.

[76] *Id.* at 8.

judgment. One of the great promises of automation is actually that is can outperform expert human judgment.

For NYA-Types, the cost of intervention after first notification remains high, though lowered with now available information about right holder's rights and their enforcement preferences. Since I defined NYA-Types as assessments which cannot be automated without negligible amount of error, their proper assessment requires either co-use or full use of (manual) human judgment which is costly. As long as this is more costly than expected harm (B>PL), a right holder can have a comparative advantage in carrying out such human judgment more cheaply. It seems therefore more effective to let the intermediary wait for a next unique notification. If automation is forced upon NYA-Types, the social cost (SC) is worsened compared to NTD ($SC_{NSD} > SC_{NTD}$) because of the additional errors of over-blocking caused by automation.

2.3 Automation of Enforcement

At the time when notice and takedown policy was conceived, it was anticipated that the system will be used by humans or firms who individually search for content, evaluate it, notify it, evaluate it again, and then make a decision about its availability. However, this description does not correspond to the existing practice anymore. Many of the steps, as was explained earlier, are increasingly automated and the so called 'algorithmic enforcement' is emerging from it.[77] This has important consequences for cost and benefit analysis as well. Before use of algorithms, it was assumed that all information and transactions would need to be carried out manually at high costs. Now many of these decisions can be automated. If we think about the potential use of automation of enforcement, the following basic picture emerges:

	Right holder	*Intermediary*	
1.	Manual detection	Manual review	
2.	Manual detection	Automated review	
3.	Automated detection	Manual review	
4.	Automated detection	Automated review	← *Bilateral filtering*
5.	Detection & review	API interface	*Unilateral filtering*
6.	Reference files	Detection & review	*Unilateral filtering*

Filtering (rows 4–6)

The scenarios (1)-(4) are usually expected under NTD model. Right holders and intermediaries are given the flexibility to choose between automation and manual handling under NTD; they can also

[77] See Maayan Perel (Filmar) and Niva Elkin-Koren, *Accountability in Algorithmic Copyright Enforcement,* 19 Stan. Tech. L. Rev. 473 (2016). See also Perel and Elkin-Koren, *supra* note 5.

rely on their mix (semi-automation). From the societal point of view, we want the parties to choose algorithms for A-Types, and human review for NYA-Types, right holders for generating notices, and intermediaries for their review. If there are, however, no corresponding incentives, right holders, in particular, will rely on automation everywhere, since it is cheaper to use and they do not face the externalities of over-notification. Similarly if intermediaries are not sanctioned by public opinion,[78] exit of users, the costs of processing counter-claims of its users or otherwise, they will use automation whenever it is cheaper and makes commercial sense for them. In other words, both sides today have strong incentives to use automation, but not necessarily high-quality one.

Situation 4 - coordinated automated enforcement – is a form of bilateral filtering and is also already taking place. Google uses the Trusted Copyright Removal Program (TCRP), which in 2012 accounted for 91,50 % for all take-downs received.[79] Right holders submitting notices often hire enforcement agents that use fingerprinting technologies to spot infringements. And Google also uses secret tools of automation to evaluate the take-downs. Similarly, in a peer-to-peer context, many right holders work together with universities and take advantage of the ACNS standard submission system.[80] Right holders again hire firms which use fingerprinting technologies such as Audible Magic to generate such notices. Universities can also use automation to respond to them, but they do not have to. In other words, mutually beneficial automation occurs even today. Such automation not only exponentially increases the scale for infringement detection and thus reduces the life expectancy of *more* infringing content, but also extends the market for new technologies.[81] As long as bilateral filtering is used for A-Types, it is not only mutually, but also socially optimal. When it is used for NYA-Types, it can be beneficial mutually, but is sub-optimal socially.

Even under NTD, intermediaries sometimes assume both tasks – detection & review. This scenario takes place in a form of a voluntary action under NTD, such as YouTube's Content ID (it is Scenario 6, however, with a reference-file requirement). As seen in the diagram above, such arrangement collapses a two stage two-player process into the sole post-notification responsibility of an intermediary. Interestingly enough, even the converse scenario when right holders assume both tasks do happen under NTD policy (Scenario 5). An example is a case where an intermediary provides a direct API-interface to right holders to identify and delete infringing content. Scenario 5 occurs sometimes as a voluntary action under NTD. In such a case, right holders can detect and act on their own on the service, however often they are contractually or technically restricted. Often, this interface is couple with some automation, or allows third-party automation to be plugged-in. Thus Scenarios 5 & 6 usually come hand in hand with some form of automation.

If *algorithmic enforcement or filtering* means automation of enforcement, it occurs not only in the last two scenarios of unilateral filtering (Scenarios 5 & 6), but also in bilateral filtering scenario

---

[78] *See* e.g. Electronic Frontier Foundation, Parker Higgins, Corynne McSherry, and Daniel Nazer, *Who Has Your Back? Protecting Your Speech from Copyright and Trademark Bullies*, Electronic Frontier Foundation (Oct. 27, 2014) available at: <https://www.eff.org/pages/who-has-your-back-copyright-trademark-2014>.
[79] Seng, *supra* note 5, at 433.
[80] *See* ACSN, Automated Copyright Notice System 2.0 (2015), <http://acns.net/> (accessed Dec. 1, 2017).
[81] Seng, *supra* note 5, at 414, 451 (increasing scale) and 417 ff (intensifying competition)

(Scenario 4), where algorithmically generated notices sent by right holders are processed by algorithms of intermediaries. Such filtering is basically a battle of two or more algorithms. Emergence of bilateral filtering is important because it means that enforcement automation is not an exclusive feature of NSD model. Automated enforcement thus can take advantage of both 'policy homes' and has three constellations: to be carried out (1) by right holders and intermediaries together, (2) only by right holders, or (3) only by intermediaries. While under NTD all three constellations take place, under NSD, the filtering by intermediaries only is the required norm.

Under notice and staydown (NSD), where unilateral filtering by intermediaries becomes compulsory, intermediaries wishing to avoid its implementation would need to obtain consent from all the notifying and potentially notifying right holders. It is clear that obtaining such consent is practically impossible, as transaction costs would be prohibitively high. This means the use of automation would remain the rule and cannot be realistically opted-out from. This contrasts with notice and takedown (NTD) model, under which bilateral filtering (Scenario 4) can be implemented without any coordination. The two other forms of unilateral filtering – by intermediaries only (Scenarios 6) and by right holders only (Scenario 5) - require coordination under NTD.

Moreover, at the point when such a bilateral filtering solution starts clearly duplicating the efforts on the detection and evaluation side, e.g. because both parties use the same technology, it is enough that only handful of right holders or intermediaries are interested in negotiating a change. So for instance, a small group of right holders can negotiate that some portion of the automation is implemented solely by some intermediaries. For instance, if a right holder and a photo-sharing platform use the same scanning technology and referential database for identifying infringements, they can negotiate about its use by just one of them. Unlike in other situations, the freeloader problem, i.e. that the enforcement measure burdens only some, but generates equal benefit to all, is not an issue here because enforcement measures can exclude non-participating right holders from obtaining benefits.[82] This means that whereas it takes all the right holders for an intermediary to be able to opt-out from an (obligatory) standard of unilateral filtering aka NSD, it takes only a few right holders to opt-in to the same system which is not obligatory. The reason for this are the asymmetric transaction costs.

NSD essentially ignores the technological divide between A-Types and NYA-Types and simply accepts the associated social costs of over-blocking the content for which technologies are not up to the task. Unlike NTD, which allows to progressively use automation where it is apt, NSD produces a unique *social cost of over-enforcement* by algorithmic tools. The intermediaries under NSD do not have an option to use automation where the risk of false positives is only negligible, and have to use it even for infringements where such risk is high. How large is such a social cost depends on the state of scanning technologies and its precision for a type of protected subject

---

[82] For discussion on problem of freeloaders, see Calabresi, *supra* note 82; For a specified freeloaders' problem in the context of bargaining after an injunction was granted. See Elizabeth Hoffman and Matthew L. Spitzer, '*The Coase Theorem: Some Experimental Tests'* (1982) 25 Journal of Law and Economics, at 96-7

matter. At the moment, the scanning technologies made a substantial progress in the area of audio-visual and musical works thanks to fingerprinting technologies, but the situation can be completely different for algorithmic enforcement of other works or protected subject matter.[83]

2.4 MARKET FOR FILTERING

One of the arguments put forward in favor of notice and staydown is that it will stimulate the market with content recognition technologies. It is argued that, at the moment, the technologies are not cheap and thus not widely available for the right holders.[84] There are no comprehensive studies of the filtering technologies market.[85] The European Commission, when proposing Art 13, did not include any market analysis in its Impact Assessment.[86]

If we take one of the technological front-runners, Audible Magic, in its public price list we can see that prices differ depending on the number of transactions. Scanning of 5000 uploaded files per month can cost around 1500 USD, while 25 000 files around 4500 USD in licensing, excluding the costs of the set-up and maintenance on the side of an intermediary. Urban and others reported that medium-sized companies engaged in file-hosting services included in their survey paid between $10,000 and $25,000 a month in fees for Audible Magic's filtering tool alone.[87] Many large platforms develop their own content recognition technologies when they reach certain scale. This is the case of Google, Facebook, and SoundCloud.

---

[83] Evan Engstrom and Nick Feamster, *The Limits of Filtering: A Look at the Functionality & Shortcomings of Content Detection Tools*, Engine (Mar. 28, 2017), <http://www.engine.is/events/category/the-limits-of-filtering-a-look-at-the-functionality-shortcomings-of-content-detection-tools>.

[84] "Many smaller copyright owners (..) lack access to third-party services and sophisticated tools to monitor for infringing uses, which can be costly, and must instead rely on manual search and notification processes." See U.S. Copyright Office, *supra* note 2, at 3.

[85] In November 2015, the European Commission contracted a study entitled: *Economic analysis of the impact of some online intermediaries on the distribution of copyright protected content* (In the terms of reference to SMART 2015/0080, it says: "The main purpose of the study is to collect data on the role and impact of such online intermediaries on the online distribution of copyright protected content and the sharing of the value created with right holders. The study should also assess the impact of possible measures that could be taken at EU level to clarify the rules applicable to online intermediaries when distributing copyright protected content."). Although the study was already completed by ECORYS, its results weren´t published yet. See ECORYS, *Small and Medium Enterprises* (2015), <http://www.ecorys.eu/casestudy/small-and-medium-enterprises> (accessed Dec. 1, 2017).

[86] Commission Staff Working Document – EC, Impact Assessment on the modernization of EU copyright rules: Part 1, Commission Staff Working Document, COM(2016) 593, available at: <https://ec.europa.eu/digital-single-market/en/news/impact-assessment-modernisation-eu-copyright-rules>.

[87] Urban et al, *supra* note 16, at 64.

Google developed its ContentID system at an alleged cost of more than $60 million.[88] But this system has already distributed $1 billion to artists, which, under the publicized 55:45 revenue split,[89] would mean almost $820 million for Google. In other words, it is not surprising that Google would not want to license the tool to competitors, since it is its 'money machine' and provides a competitive edge over those who use the widely used proprietary systems from Audible Magic or other companies.[90] Soundcloud said to have paid 5 million EUR for such technologies.[91] Facebook recently announced to develop its own tool as well.[92] Such content recognition tools then become heart of the user-service interaction and often also the business model of the platform.

As explained above, content recognition technologies are today used for two purposes: (a) to pre-emptively detect infringements by right holders (Scenarios 3, 4, 5) and by intermediaries (Scenario 6) and (b) to automatically review the notifications received by right holders (Scenarios 2 and 4). This means that sometimes the same content recognition technologies can meet on the submission and review stages, even without knowing or coordinating. Under NTD, market for technologies is on both sides, among right holders and intermediaries who may want to use the technology to save the costs. Under NSD, market is predominantly on the side of intermediaries who have to use the technology to be able to enter the market and operate there.

The right holders claim that content recognition technologies currently are not cheap enough in order to be sufficiently inclusive also for smaller right holders. This is hard to verify as the data is not publicly available. Audible Magic claims that it sells its Broadcast Monitoring service for $75-

---

[88] *See* Google, 'Testimony of Katherine Oyama, Sr. Copyright Policy Counsel, Google Inc. House Judiciary Subcommittee on Courts, Intellectual Property, and the Internet Hearing on "Section 512 of Title 17"' (Mar. 13, 2014), available at: <http://judiciary.house.gov/_cache/files/be93d452-945a-4fff-83ec-b3f51de782b3/031314-testimony---oyama.pdf>

[89] Todd Spangler, '*Despite YouTube's Emmy, Google Still Has a Long Way to Go*', Variety (Oct. 24, 2013), <http://variety.com/2013/biz/news/despite-youtubes-emmy-google-still-has-a-long-way-to-go-1200756170/> (accessed Nov. 19, 2014); Danielle Duarte, '*Video Monetization, YouTube, and Multi-Channel Networks 101'*, Dlrepoter (Apr. 3, 2014) <http://dlreporter.com/2014/04/03/video-monetization-youtube-and-multi-channel-partnerships-101/> (accessed Nov. 19, 2014); JWFocus, '*The Future of Online Video: Multi-Channel Video Strategy*', White Paper – *JW Focus: Entertainment* (Mar. 1, 2014); Paul Tassi, '*The Injustice Of The YouTube Content ID Crackdown Reveals Google's Dark Side'* (*Forbes*, 19 December 2013) <http://www.forbes.com/sites/insertcoin/2013/12/19/the-injustice-of-the-youtube-content-id-crackdown-reveals-googles-dark-side/> (accessed Nov. 19 2014).

[90] Audible has several competitors, such as Digimarc (publishing industry), Gracenote, Pexeso and DetNec, now owned by Mark Monitor. These and different technologies are then used by many agents (content management companies/scanning vendors) offering administration of online infringements. For the list of the most widely used companies - *See* Seng, *supra* note 5, at 369 & 396

[91] Soundcloud has estimated in its reply to the public consultation on online platforms that it has spent approximately 5 million EUR on such technologies – see <https://ec.europa.eu/eusurvey/pdf/answer/6acf2b21-865a-402c-876a-e2b67c0ceef9>

[92] Techcrunch, Josh Constine, *Facebook launches video Rights Manager to combat freebooting*, TechCrunch (Apr. 12, 2016) <https://techcrunch.com/2016/04/12/content-fb/> (accessed Dec. 1, 2017).

250 per month per channel monitored with a $1,000 monthly minimum.[93] But let's accept, for the sake of argument, that existing technologies are inaccessible. This could suggest that the market is not competitive enough or that technologies are still not fully fit for the task. Why could this be happening?

Firstly, one of the inefficiencies of the current NTD system seems to be that it poses obstacles to scalability of high-quality automation. Different countries use different notice and takedown processes with divergent notice requirements. Some countries might even outlaw the analysis of the platform content for the purposes detection of infringements.[94] This fragments the market and prevents firms from employing cross-platform and cross-country notification. Standardization could facilitate detection of infringements as well as cross-platform submission of notices. Such welfare-maximizing effect of standardization is broadly observed in the literature in other areas. Broadly-adopted standards can produce efficiency-enhancing network effects and other benefits.[95] Swan identifies the following main benefits of standardization: (1) providing for inter-operability or compatibility; (2) the provision of a minimum level of quality; (3) the reduction of variety, allowing for economies of scale and (4) the provision of information.[96]

Even with standardization, however, one problem could remain. Since any automation of enforcement requires reference files, and their multiplied copying in the process, any tool inadvertently engages in copyright relevant acts. Moreover, such licensing requires clearing not only the targeted content of clients, but *any* copyrighted content that is being analyzed. Clearing rights for such tools can be then very expensive or even impossible if it cannot benefit from an exception.[97] Under NTD, right holders are unlikely to be interested to target technologies that help to detect infringing content. They can obtain such clearance of rights in exchange for cheaper rates (if necessary). Under NSD, however, right holders are not anymore clients, and their activity might be subject to licensing arrangements that can make the entry to the market of filtering technologies again more difficult and costly. To address this, the development of filtering technologies engaging in data-mining processes could be incentivized by means of an exception.[98]

---

[93] See Audible Magic, Broadcast Monitoring (2017), <https://www.audiblemagic.com/broadcast-monitoring/> (accessed Dec. 1, 2017)

[94] There might be intellectual property as well as data protection issues that would require solution.

[95] Michael L Katz and Carl Shapiro, *Network externalities, competition, and compatibility* (1985), 3 American Economic Review 75, at 424–40; CARL SHAPIRO AND HAL VARIAN, *INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY* (Harvard Business School, 1999); (Leslie J. Yonce ed., 1st ed. 1954). CARL SHAPIRO, *NAVIGATING THE PATENT THICKET: CROSS LICENSES, PATENT POOLS, AND STANDARD SETTING* in INNOVATION POLICY AND THE ECONOMY (Vol. 1, Adam Jaffe, Josh Lerner, and Scott Stern, eds., MIT Press, 2001), at 119; Mark L. Lemley and Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev, 2 (1991).

[96] See G. M. Peter Swann, *The Economics of Standardization", Final Report for Standards and Technical Regulations Directorate* (London: Department of Trade and Industry, 2000).

[97] In the United States, the tool are likely to benefit from a fair use exemption. This is less likely in the EU at the moment.

[98] Proposal on DSM Directive, *supra* note 49, Article 3(1).

Second, the non-availability of filtering technologies for some right holders might be also only the consequence of the current state of technological development. It might be that some category of right holders cannot automate their enforcement efforts because no appropriate technology exists as of yet. In such a case, however, imposing an obligation to implement such (non-existing) technology by means of NSD as a market-entry requirement just acts as strict liability rule. The solution that is needed then is one of better incentives for new filtering technologies that can automatize previously NYA-Types. NSD, however, provides very ambiguous incentives in this regard. As I try to show, incentives are worse than under NTD.

On one hand, one can argue that since automation is now a market-entry condition imposed on all the firms, there will be many more firms investing in the technology then before when it was only optional. In other words, the supply will improve thanks to higher demand. However, there are two important limitations that put such effect in doubt, namely: (1) the number of firms operating on the newly conditioned market is likely to decrease, (2) an entire class of demand – one coming from right holders – is very likely to marginalize. Since fewer firms can afford technologies, fewer will want to enter regulated market and rather seek other product and geographical markets where no such barriers exist. Moreover, since right holders on the regulated market are not anymore interested in the filtering technologies, as intermediaries do the filtering for them, they have no incentives to continue to be the customers.

This means that the demand for technologies is actually likely to shrink under NSD compared to NTD, where both intermediaries and right holders are interested in the services. In addition, there is an additional dynamic that might question existence of cheap licensing of filtering for intermediaries. Bigger intermediaries are very likely to develop such expensive mechanisms internally and then keep them in-house as a competitive advantage. This is understandable as filtering becomes means of competition and a tool how to drive competitors out of market. Under NTD, the incentives to develop technology are more aligned. Right holder associations, such as INTA for trademarks or collecting societies for copyright, can aggregate resources for common technological solutions that could be used by all their members or even public (e.g. via open-sourcing them). This is because the interests to prevent infringements are shared among the right holders.

All this suggests that, in fact, filtering technologies are more likely to become easily accessible and cheaper when the primary customers remain numerous right holders and some intermediaries under NTD. Even assuming away negative changes in the demand for technology, it is therefore more realistic to expect the development of cheap and widely available crowd-sourced filtering solutions to come from cooperation between right holders (who are mostly united in the interest of reduction of infringements) rather than from any cooperation among intermediaries, for whom such solutions are a source of competitive advantage. To create a proper market, however, standardization is of essence. Such standardization may be used by the governments to target innovation in a particular direction and can demand some fundamental transparency (see Section 3.2).

3 SWITCHING FROM NTD TO NSD

The promise of NSD is that it will deliver cost-effective way how to prevent re-appearance of the future content. In this part, I look at associated cost and benefits and compare them in abstract.

3.1 COSTS AND BENEFITS

The unilateral filtering obligations, whether pushed by a court or legislator, have both advantages and disadvantages. They produce different set of costs and benefits. When comparing NTD and NSD, one should, among other things, also take into account to what extent NSD is addressing the problems posed by NTD and whether they could not be addressed without inflicting other types of harm. When we look at costs under Scenarios (1)-(4) and staydown policy option, we can observe the following:

Costs	NTD	NSD
Right holders	(i) Screening (ii) Notification	(i) - (ii) First notification
Intermediaries	(i) - (ii) Evaluation (iii) Action	(i) Screening (ii) Evaluation (iii) Action

This means that the switch from NTD to NSD policy shifts the costs of screening onto intermediaries. As was discussed above, as long as this concerns A-Types, this is an efficient transfer of responsibilities. If it concerns NYA-Types, it creates additional costs because right holders would be the cheaper cost-avoiders for the purposes of detection. If policy does not distinguish between the two, the right holders are relieved of any costs, with the exception of production of the first-notice for a particular service and sending the reference files. As explained in Part 1.2, NTD itself is not certainly innocent of collateral social costs. In particular, the costs of over-notification, over-compliance and under-assertion of rights were repeatedly documented and discussed in the literature.[99] By prescribing automation in all cases, NSD, however, creates a novel set of social costs, which I refer to as *over-use of automation*.

The overall consequence of staydown policy is abstract transfer of the screening costs from right holders to intermediaries. This is a cross-subsidy of enforcement. However, one of the consequences of such transfer is the *multiplication of the compliance costs*. While notice and takedown allows intermediaries to adjust their mechanisms to the overall notification-workload, the stay-down policy requires them to implement costly automated enforcement even if one right

[99] See Lenka Fiala and Martin Husovec, *Using Experimental Evidence to Design Optimal Notice and Takedown Process*, TILEC Working Paper Series (2018) available at <https://ssrn.com/abstract=3218286> (providing a summary of the literature)

holder issues his or her first-notice. Irrespective of the number of right holders wishing filtering, they have to scan all the content. In other words even an interest of a single right holder will lead to an obligation to introduce a set of automated tools for all the content, regardless of the private benefit derived for participating right holders. This means that, at least on the platform-level, use of automation can be sometimes clear waste of resources as the investment is not proportionate to the benefit derived.

Last but not least, NSD is likely to cause *increased concentration* of the regulated market due to higher entry conditions of filtering. This means not only foregone competition in those markets, but also limited follow-on innovation in the area. If a country remains a lonely actor in the area, other countries will gain a corresponding comparative advantage in attracting start-ups as no licensing of filtering means easier experimentation on the market. This does not mean that established firms will be unlikely to enter such regulated markets, rather they will not be the source of new untested services. Moreover, great attention should be paid to the licensing of reference files which are precondition of the functioning of staydown. If right holders start exploiting such licensing as a vehicle for additional royalties, or conditions, the user-generated content stops being the area of permission-less decentralized innovation. De facto, such licensing would provide a 'choke-point' which regular licensing of content provides to labels against the streaming services.

On the other hand, given that under Scenario 6, no two stage process needs to take place, the screening occurs usually already on the upload-level. This means that infringing information is not made available and thus no corresponding cost is inflicted upon a right holder. This *benefit of ex ante blocking* - avoided loss of the pre-notification period - then constitutes one of the main arguments in favor of the immediate default staydown. If we take the study of Lauinger and others[100] as a rough benchmark for potential effects on some parts of the ecosystem, then this could mean saving up those few days of availability of infringing content before the notice is produced. However, the effect of pre-blocking is limited by detection capabilities of the filtering technologies, which also do not find all the content. And most importantly, it is limited by the fact that many bad players will simply continue to serve the black market from abroad. As the research in the area of website-blocking shows, the substitution between different methods of obtaining illegal content should not be under-estimated.[101]

One additional benefit would be extra detection from new stay-down implementers. The theory is that since under NTD firms implement NSD only voluntarily, under NSD, every firm will have to implement it. Staydown implementation will improve detection beyond previous notifications and this will create an extra benefit. However, as I explained above, this could be of limited effect.

---

[100] Lauinger et al., *supra* note 75, at 8

[101] For website-blocking research: Brett Danaher, Michael D. Smith, and Rahul Telang, *The Effect of Piracy Website Blocking on Consumer Behavior*, Carnegie Mellon University Working Paper (Nov. 2015). Available at SSRN: <http://ssrn.com/abstract=2612063> (accessed Dec. 1, 2017); See also Brett Danaher Michael D. Smith, *Impact of the Megaupload Shutdown on Movie Sales*, International Journal of Industrial Organization 33 (Mar. 2014), at 1-8.

First, the group of voluntary NSD-adopters is not negligible even today. As a matter of fact, all big and many mid-sized platforms seems to integrate some type of automation already. Unless the law is meant to push their existing solutions further in some way, there is no extra benefit derived from them. Second, the group of non-adopters which constitutes new potential implementers is likely to shrink under NSD. It is understandable that a new filtering condition will force some – mostly smaller players - to revisit their business models or exit regulated markets. Third, the extra benefit derived from new NSD-implementers will depend on the previous enforcement under NTD. As far as automation was already used to generate notices by right holders on those services, the benefits are limited by quality and capability of prescribed technologies. This means that it is rather right holders who did not use automation before that are likely to see significant spike in detection – provided that they are interested. For other right holders, the crucial benefit is then transfer of the enforcement costs onto intermediaries.

	Extra Costs	Extra Benefits
Switch from NTD to NSD	(C1) Over-use of automation: (a) compliance costs, (b) collateral over-blocking or (c) manual review (C2) Platform concentration: (a) competition, (b) innovation	(B1) Blocking from new NSD-implementers

It is hard to put numbers in the categories of costs and benefits which we have discussed. However, that is not my point here. A well-intended legislator would propose a switch from NTD to NSD only if the problems that it tries to address in the existing system are impossible to solve otherwise, while promises of the new system are substantial to offset its expected costs. In my view, this is not what we observe here. As I argue next, mere standardization of NTD with a view of automation offers important solutions to some of the existing inefficiencies.

Looking at the main benefits of NSD, it is clear that blocking content before it is aired online is something that *cannot* be achieved on *all* the platforms without prescribing a staydown obligation. However, as the discussion in Part 2.3 has shown, even under NTD, many market players are likely to develop such systems voluntarily. This means that the legislator needs to focus on the benefits from the pool of previous non-adopters, taking into account how such group will shrink as a response to staydown obligation. As I suggested in Part 2.3, non-cooperated bilateral filtering can achieve comparable results as unilateral filtering forced by staydown. It requires, however, proper market for high-quality filtering technologies which is only possible if the entire procedure is better standardized and thus better scalable. This means that expected new benefits have to be also compared with the set of new opportunities still existing within NTD.

And this brings us to an interesting realization. When one looks at the structure of the costs and benefits, there is something very interesting about them. They all depend on the state of technology (T) as defined by its price (p) and quality (q).

	Extra Costs	Extra Benefits

Switch from NTD to NSD	(C1***T**) Over-use of automation: (a) compliance costs, (b) collateral over-blocking or (c) manual review (C2***T**) Platform concentration: (a) competition, (b) innovation	(B1***T**) Ex ante blocking from new NSD-implementers

First of all, the number of new implementers and the associated benefits (B1) depends on state of technology (T) under NTD. If such technology is cheap and of high quality already under NTD, most of the platforms have likely implemented it already since it saves them processing costs. There are very few non-adopters and the switch to NSD thus delivers smaller benefits. Thus the more superior state of technology (T), the lower extra benefits from NSD (B1). Second, the state of technology (T) also influences the social costs (C1; C2). The worse the state of technology - higher costs or error rate -, the higher the number of firms exiting the market (C2a) or going to innovate elsewhere (C2b) and the costs of over-use of automation (C1). Thus ironically, the lower the costs and error rate of filtering, the higher would be their adoption also on the voluntary basis and thus again lower would be the benefit from new implementers. In other words, if technology is good and affordable, right holders and intermediaries will use it. Legally prescribing creates no new efficiencies. It only transfers the enforcement costs.

This shows that the state of filtering technology defined by its price and quality is crucial. If this is the case, then we should be interested in maximizing it (T) as a *primary goal*. I conclude that better incentives to *develop* automation exist under NTD due to homogenous interest of market players. Moreover, NTD provides firms with strong incentives to *adopt* existing automating technologies since it saves them resources. So how to best get to those technologies quickly?

3.2 Case for Standardization

In order to incentivize superior technologies, we need to be thinking of markets for filtering services. At the moment, they are fragmented, often not sufficiently scalable and lack reasons to get more precise. To remedy this structural problems, I would suggest two areas of intervention: (a) standardization of the notice and takedown and (b) more targeted incentive structure for the development of new high-quality filtering technologies.

As suggested above, today's problem appears not that the law does not mandate automation. Automation is being used a lot. It rather seems to be the fact that it is often of very low quality and right holders cannot always fully take advantage of their automated tools due to fragmentation or obstructive notice submission systems.[102] Therefore, what needs to be facilitated is a submission of high quality algorithmically generated notices, also called robo-

[102] There are many ways automated submission can be obstructed, e.g. by notice caps per right holders, limiting submission on IP addresses, etc. For more discussion on former submission caps in Google services. See Seng, *supra* note 5, at 416.

notices or auto-notices, so that intermediaries who produce high externalities cannot avoid getting them back through the large number of notices received (a boomerang effect). However, the technological design of interfaces for such robo-notices should incorporate incentives for development and use of *high-quality* technologies, not just any technologies.[103]

As long as enforcement agents are only motivated to notify as much as possible, regardless of the precision, automation is waste of everyone's resources. Innovation in the area of detection technologies needs to be channeled to solutions which have negligible margin of error. If such solution is developed which transforms infringements of some type to the area of A-Types, automation should be encouraged. Unless automation of infringements is not doing better than a trained human expert would, it constitutes no improvement of affairs. Such infringements are NYA-Types and should be kept away from the full automated submission and review until the technology gets better to at least supersede humans.

This choice between automation and regular options can be facilitated. For instance, the law could prescribe an obligation of intermediaries to provide for a *submission interface* for machine readable notices of right holders (e.g. to receive XML submissions). Such interface and its conditions could then be further specified by means of standardization. This interface would have a two-fold function. The intermediaries cannot restrict the free flow of justified notices regarding infringing content and right holders are able to scale their submission efforts depending on the limits of the currently available technology. However, the standardized conditions should only reward by the type of automation that is wished from the social perspective – one with negligible false positives. Such submission should not be available for NYA-Types. And since the state of technology defines which those are, the better and more accurate the technology available, the more infringing activity on the service can be flagged automatically.

Such solution creates a market for filtering on both sides – among intermediaries as well as right holders. It allows to accommodate automation into the enforcement framework progressively, as it develops and improves. This way the right holders and intermediaries can be motivated to use automation for A-Types, and manual review or semi-automation with manual review for NYA-Types. Where solutions of both parties consider a content an A-Type, a single stream of automated enforcement is created (see Scenario 4). This data flow then emulates the effects of staydown, with two differences. It does not (1) take place on the upload level, but only after the content is published, and (2) it does not relieve right holders from incurring the costs. However, both issues can be agreed upon in voluntary agreements to completely replicate staydown. And the cheaper the technology, the more likely these are to materialize.

To design such optimal incentives, the NTD frameworks should spell out several conditions for automated submission. First, it should be available only to those right holders whose identity is verified. This is to prevent fraudulent submissions by increasing accountability. Second, machine submission should be allowed only if algorithms generate a negligible number of false positives.

---

[103] Seng notices that targets can incentivize better technologies too. See *Id.* 417 ff.

The exact number should be informed by empirical evidence of what is currently possible to achieve,[104] and could be further reduced with technological progress. The benchmark can be initially drawn from average human error. Third, an intermediary should have the possibility to suspend or punish for inflow of robonotices from a particular right holder if the margin of error was overstepped. This way, right holder themselves pressure enforcement agents for quality. Transparency would then facilitate competition on the merits.

Legally speaking, in the European Union, such standardization could be developed under the so called New Approach.[105] The E-Commerce Directive could foresee standardization for robonotices with the basic criteria of a) authentication, b) negligible false positives and c) suspension-sanction mechanism. In the European Union, the European Commission recently came up with the idea to propose fast-lanes for so called trusted flaggers who are defined as 'an individual or entity which is considered by a hosting service provider to have particular expertise and responsibilities for the purposes of tackling illegal content online'.[106] This could be used to condition such fast-lanes upon the quality of notifications.[107] In the United States, DMCA could anticipate separate robonotice fast-lanes attached with the same conditions.

To illustrate how this system could work, imagine the infringing ecosystem around cyberlockers such as BitShare or Megaupload. Cyberlockers are services that enable users to upload content and share it as links with third parties, who can download it at anytime. According to a recent study,[108] approximately 70 % of the revenue of those providing direct download services comes from users payments for a premium account, and 30 % from advertising on their websites.[109] On average, they enjoy a 63.4 % profit ratio.[110] If right holders could not only use scanning

---

[104] Seng reported that there are companies who already achieving a margin of error below 1 % in the current average Trusted Copyright Removal Program of Google. See Seng, *supra* note 5, at 417 ff.

[105] With the 'Council Resolution of 7 May 1985 on a New Approach to technical harmonisation and standards', the primary responsibility for creating European standards was given to the following organizations: CEN-CENELEC and ETSI. This framework creates incentives and opportunities for private companies to participate in the standards development activities. Under the New Approach, the regulatory function of the European Commission and Council is limited to specification of the so called 'essential requirements'. These refer to crucial requirements in terms of health, safety, environmental and consumer protection requirements. The law then delegates standards development to three selected SDOs (ETSI, CEN, CENELEC) and equipped them with some legal effects.

[106] European Commission, *Commission Recommendation on measures to effectively tackle illegal content online* C(2018) 1177 final, at para 4(g), available at < http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=50095>

[107] Arguably, those constitute very 'clear and objective conditions for determining which individuals or entities [intermediaries] consider as trusted flaggers' (*Id.* at para 26)

[108] Net Names, *'Behind the Cyberlocker Door: A Report on How Shadowy Cyberlocker Businesses Use Credit Card Companies to Make Millions'* (2014), available at: <http://fia-actors.com/fileadmin/user_upload/News/Documents/2014/Oct/dca-netnames-cyber-profibility-ph11.pdf>.

[109] *Id. at* 3

[110] *Id. at* 30

technologies to target infringing content, as they do today, but also algorithmically generate and submit notices under a uniform mandatory protocol to all the cyberlockers, they could significantly scale and also speed-up the notice submission. As a consequence, cyberlockers would be exposed to more processing costs to the point that their margins are reduced significantly, especially after users at the same time start to quit their services.

Even if such cyberlockers decide to take the content down without any evaluation, they cannot escape certain consequences. Provided that the technologies used by right holders are good enough, they could substantially shorten the life-expectancy of the infringing content,[111] which, surprisingly, is currently several weeks[112]. Short lived infringing content would severely endanger the business models of 'bad players' and the comfort of their customers. Moreover, the right holders would be motivated to minimize the number of false positives, since if automated submission creates more than their negligible amount, cyberlockers could temporarily terminate this option, thus leaving the right holders with only regular human submission process, which is difficult to scale. In this way, the right holders themselves push for better technologies that can distinguish A-Types and NYA-Types and reserve the latter for the regular submission process. Within the regular submission process, false allegations should expose the right holders to small assignable monetary statutory penalties to improve the quality of submission.[113]

Naturally, there is an *information problem* associated with determining instances and the overall rate of false positives. The infringement cannot be always established with complete certainty. This problem is especially significant for individual instances of infringements. It is, however, less problematic for establishing the overall rate of false positives, where the count is averaged over a selected period of time. Moreover, since the decision to punish by suspending the access to an automated interface lies with the intermediaries, if there is too much uncertainty about the exact rate of false positives, they may trigger the suspension at any arbitrary higher rate than the prescribed one. After all, the law does not force them to use this option. However, since lower quality of submission eats into resources in the long-run, it might be profitable to invest in disciplining the ecosystem.

---

[111] Today, the most significant problem is that the existing scheme cannot be sufficiently scaled to target all or even most of the content. As a consequence, the notice and take-down makes content short-lived when notices are sent, but for the content which is never notified (unnoticed content), the life-expectancy is surprisingly long and usually terminated by the services themselves - *See* Lauinger et al., *supra* note 75, at 8.

[112] Lauinger et al. observed in their study that "on some OCHs, more pirated files appear to be deleted due to expiry rather than because of takedown requests". See Lauinger et al., *supra* note 75, at 7. It is clear that the problem for enforcement are not those infringements that were notified, but those that could not be notified due to enforcement budget restraints. It is these infringements that stay longer on the platforms and harm right holders. The only way to cope with this is to institute a system where right holder can better scale their enforcement efforts against all the players at once. This is exactly what is proposed in this work.

[113] For instance, one can think of coupling ex-post ADR with fines for providers (See Fiala and Husovec, *supra* 99), which could be partly reclaimed by intermediaries against the notifiers who issued false requests.

Alternatively, some types of intermediaries could also be pushed further to Scenario 5, in which not only standardization is imposed on the enforcement chain, but also API-interfaces with a direct conditional access for right holders. Such interface could then embody the quality-control conditions discussed above so that it assures use of high-quality automation for A-Types and otherwise human judgment for NYA-Types. It could also create more room for transparency since the interaction of right holders and intermediaries could be *structured* and even made partly available to *public*, or at least semi-public for researchers. Such APIs should allow use of different technologies in order to benefit from competition on their quality. Needless to say, it has to be implemented in a way that respect fundamental rights.

One of the advantages of this approach, compared to NSD, is that it enables *individualized enforcement* by right holders. This is because right holders on their own decide whether they want to keep particular content on-line if it is infringing, whether they want to endorse infringing behavior or curb it by blocking it completely. Unlike under NSD, they can do it not only on work-level, but also use-level. The automated submission interface can also easily accommodate further functions, such as the possibility for right holders to accept or reject certain monetization offers by an intermediary.[114] This could be a great source of innovative services from agents who would analyze the potential income and make such decisions for right holders algorithmically.

Under such standardized NTD, right holders and intermediaries are encouraged to find and develop new scanning technologies that can automate more submission with very few false positives. The possibilities of scale and speed of submission would create new market opportunities and also competition among infringement management services. Their services should thus become more affordable for smaller right holders in the long run. The government can further support development of high-quality technologies through subsidies or prizes.

4 CONCLUDING REMARKS

High-quality automation of copyright enforcement that produces negligible enforcement errors should be embraced and incentivized. This will push innovation in the right direction. In comparing two policy options, standardized notice and takedown (NTD) process promotes such automation better than notice and staydown (NSD) because it provides for stronger market incentives for the development of new filtering technologies and allows area-by-area introduction as the technologies progress. Moreover, NTD preserves individualized enforcement. As a consequence, standardized NTD is a superior policy option exactly because it better embraces high-quality automation with lesser undesirable externalities. However, processing of algorithmically generated notices should be always conditional upon their quality which should, at the very least, supersede humans in their precision. For the policy makers this means that staydown obligations that precondition the market entry, such as Art 13 of the DSM Directive in the European Union,

[114] Symphonic is a service which checks video content beyond those caught by ContentID, and helps to further monetize the content. For further information on the service, visit Symphonic Website: <http://symphonicdistribution.com/contentid/>.

are better to be replaced by policies seeking further harmonization and standardization of notice and takedown process by creating robonotice submission-lanes incentivizing high quality. To further accelerate the transition, the governments could also intervene on the side of demand of automated technologies which could stimulate more affordable services to small rights holders and small platforms.