

# ONLINE SERVICE PROVIDERS AND BLOCKCHAIN: UNDERMINING COPYRIGHT GOALS?

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# Online Service Providers and blockchain: undermining copyright goals?

Tiarnan Cahill\*

Outstanding LLM Dissertations 2021

## Abstract

This thesis will analyse whether online service providers critically undermine the functionality/goals of copyright, and to what extent blockchain technology can assist or entrench any arising issues. Analysis will begin with online service providers (OSPs) and provide a breakdown of how platforms interact with users, copyright, and the relationship between all three. Moving forward, analysis will continue by looking at the fundamental aspects of blockchain technology, and how these interact with OSPs in providing potential solutions or in fact posing more questions to copyright. Finally, this thesis will conclude that, through overriding desire for commercial control and growth, there are aspects of OSPs that do undermine copyright. Meanwhile, blockchain has the potential to alter the status quo, and galvanise copyright in favour of the innovator, re-calibrating the balance of power away from intermediaries. However, too much of the potential of blockchain is subject to theory or imperfect technological advancements, which ultimately means that blockchain currently cannot substantially reinforce or assist copyright in relation to problems posed by OSPs. With that being said, whilst OSPs present several significant problems to the functionality/goals of copyright, overall, such platforms do not critically undermine copyright. OSPs have encouraged unparalleled content creation and secured substantial revenue opportunities for innovators by nurturing primary and secondary markets.

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## Chapter 1 – Introduction

With the advent of the Internet came society-altering changes to the way in which information was consumed and distributed. Peer-to-peer file-sharing completely altered global industries in film, music, television, and art. Before digitisation:

Creative products, such as movies, music, and books, have high fixed costs and low marginal costs. Private firms have traditionally been able to bring them profitably to market because these products are excludable, through a combination of technology and the complementary legal framework provided by copyright law.<sup>1</sup>

However, with peer-to-peer file-sharing, and, subsequently, the emergence of online service platforms (OSPs), there have been massive reductions in relation to the cost of producing and making available new content.<sup>2</sup> From amateur user generated content (UGC) to professional grade works, OSPs have made creation and access universal.

By developing the platforms that would ultimately become the backbone of digital works on the internet, OSPs have become both the enablers and gatekeepers of digital content.<sup>3</sup> Representatives of industries most impacted by the rise of these platforms, such as The International Federation of the Phonographic Industry, would say that this role that OSPs have attained disrupts the balance between technology and copyright to the detriment of the industry and the individual creator.<sup>4</sup> This idea has perforated into legislation, and one can see the manifestation of the worries of the traditional industry organisations contained in Article 17 of The Directive on Copyright in the Digital Single Market, which imposes, *inter alia*, certain duties of care on 'online content sharing service providers' (OCSSPs).<sup>5</sup> As highlighted in the aftermath of Article 17, in the wake of both industry and scholarly disagreement, the relationship between OSPs, Copyright, and those that copyright seeks to benefit, is a complex one.

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<sup>1</sup> J Waldfoegel, "Copyright Protection, Technological Change, and the Quality of New Products: Evidence from Recorded Music since Napster" [2012] 55 J.L.E. 4, 715

<sup>2</sup> *Ibid.* 716

<sup>3</sup> M Patton, "How to Protect Users' Copyright Rights in the Age of Social Media Platforms and Their Unread Terms of Service" [2019] 53 University of San Francisco Law Review 3, 463-471

<sup>4</sup> J Malcom, "Recording Industry Claims Imaginary Value Gap as a Bigger Threat Than Piracy" (EFF, 2017) <<https://www.eff.org/deeplinks/2017/05/recording-industry-claims-imaginary-value-gap-bigger-threat-piracy>> accessed 20 July 2021

<sup>5</sup> Article 17(4) Directive on Copyright in the Digital Single Market [2019] OJ 2 130/118

Blockchain technology, a tamper-resistant, digital ledger that uses cryptographic keys to secure immutable data, has been hailed as a potential solution to many problems, one of which being that of OSPs and the issues they pose to copyright.<sup>6</sup>

This thesis, utilising relevant scholarly evidence, will analyse whether or not OSPs critically undermine the functionality or goals of copyright, i.e. the facilitation of creativity, making available to the public subsequent innovative work, and ensuring fair and reasonable remuneration. Further analysis will investigate to what extent blockchain technology can aid in solving problems presented by OSPs relating to copyright. The structure of this thesis will be as follows:

Chapter 2: Chapter two will be an analysis of online service providers and the impact such platforms have on copyright. This chapter will explore platform terms of service, technological nudging, the perceived 'value gap' created by OSPs and OSPs methods of copyright moderation, specifically the notice and take-down regime.

Chapter 3: Chapter three will analyse how blockchain technology can help tackle some of the issues raised by OSPs with regard to copyright. This chapter will look at various aspects of blockchain including: The fundamental characteristics of blockchain, such as immutability, consensus, and transparency. Analysis will move on to smart-contracts, and a blockchain-based global repository of rights management information (RMI). The final section of this chapter will identify issues with blockchain technology including the 'garbage in, garbage out' problem, the network factor, and regulatory potential.

Chapter 4: Chapter four will contain the conclusion of this thesis. It will comprise a summary analysis and opinion based on the research and conclusions contained in the previous chapters.

## **Chapter 2 – Online Service Platforms**

Online service providers (OSPs) or online intermediaries, operate within the digital environment and provide a pivotal role in information society.<sup>7</sup> OSPs engage in increasingly diverse areas of business, but almost all such business revolves around the storing, and making available, of a plethora of information derived from users and the content they create.<sup>8</sup> Examples of such OSPs include internet access providers such as British Telecoms, social media sites such as

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<sup>6</sup> M Nofer et al, "Blockchain" [2017] 59 B.I.S.E. 3, 183

<sup>7</sup> P Van Eecke, "Online Service Providers and Liability: A Plea for a Balanced Approach" [2011] 48 C.M.L.R. 5, 1455

<sup>8</sup> Ibid.

Facebook, and content-based sites such as Pinterest or YouTube. Intermediaries that engage largely with user generated content, (UGC) generally provide mechanisms to encourage users to produce, edit and upload more content, so that OSPs can continue to profit from revenue streams such as advertising, data mining, and rights licencing etc.<sup>9</sup> OSPs have evolved to provide near universally free infrastructure and tools to users that: “facilitate digital expression, interaction, and the communication of information.”<sup>10</sup> This evolution has expanded the socio-economic impact of OSPs, who exert substantial control over the balance between the freedom of user rights and the commercialisation of UGC.<sup>11</sup>

## 2.1. Terms of Service, Automated Licensing

To maximise benefit from users and their generated content, Online Service Providers (OSPs) such as Facebook, Twitter and YouTube employ broad Terms and Conditions that include automatic licence grants to uploaded content.<sup>12</sup> These all-encompassing licences, which are born from The US Digital Millennium Copyright Act, and do not consider country- specific application, create a “significant imbalance” between users and intermediary content platforms.<sup>13</sup> In doing so, such terms undermine users<sup>14</sup> incentive to create and upload by overreaching in their scope, and confusing users as to whether they can rely on local, potentially stronger, protection.<sup>15</sup> Facebook, as an example, exerts commercial control over UGC by utilising an automatic licence which grants: “transferable, sub-licensable, royalty-free and worldwide licence to host, use, distribute, modify, run, copy, publicly perform or display, translate and create derivative works.”<sup>16</sup> This language is essentially identical to that applied by Twitter, Instagram, YouTube, and Pinterest and applies to any content that is covered by IPR.<sup>17</sup> Platforms can subsequently sub-license users’ content to third parties, granting them access to content, without paying the original content creator. Copyright functionality therefore is undermined as

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<sup>9</sup> M Taddeo, L Floridi, “The Debate on the Moral Responsibilities of Online Service Providers” [2016] S.E.E. 22, 1575 - 1576

<sup>10</sup> Ibid.

<sup>11</sup> J Litman, “What We Don’t See When We See Copyright as Property” [2018] 77 C.L.J. 3, 536-542

<sup>12</sup> Terms of Service, Twitter [2021] 5

<sup>13</sup> Indeed, the licences are usually subject to the exclusive jurisdiction of California.

B Van Alsenoy et al, “From social media service to advertising network: A critical analysis of Facebook’s Revised Policies and Terms” [2015] 45

<sup>14</sup> Users encompass both individual ‘consumers’ and businesses of all sizes seeking to market their goods and services and engage with customers using OSPs

<sup>15</sup> Ibid.31

<sup>16</sup> Terms of Service, Facebook [2021] 3.3

<sup>17</sup> Terms of Service, Twitter [2021] 5, Terms of Use, Instagram [2021], Terms of Service, YouTube [2021], Terms of Service, Pinterest [2021] 3.b

platforms, operating as enablers and gatekeepers, can use copyright itself to subvert users, who receive no compensation and lack control over the dissemination of their content.<sup>18</sup>

Furthermore, in addition to overreaching licences, potential creators seeking to engage with OSPs must wade through a plethora of dense legalese to work out precisely what will happen to their content once it is uploaded.<sup>19</sup> As a result of this, users either do not read the terms of service at all, or they do not understand what they mean. Obar & Oeldorf-Hirsch conducted an empirical investigation into user reading behaviour relating to T o S, with results showing that individuals spent only fifty-one seconds reading the displayed information.<sup>20</sup> In conjunction with this data, Fiesler, Lampe and Bruckman found that indeed, “the variability of licensing terms across websites, the mismatch between user expectation and reality, and differing user opinions about licensing terms,” is a ubiquitous problem.<sup>21</sup> Both studies demonstrate that users do not engage with, or understand, the terms of service that they sign and the consequences this may have on the content they produce. As studied by Kretschmer, generally creators have a poor understanding of how copyright operates, and this is compounded by OSPs using dense legalese.<sup>22</sup> Platforms therefore serve to undermine the functionality of copyright by continuing to rely on opaque terms of service, as such terms dilute the user’s ability to effectively wield their copyright, and force many to take the approach of ‘better safe than sorry’, with a resultant chilling effect on creativity in favour of certainty.<sup>23</sup>

### *2.1.1. Technological Nudges*

Moreover, the uncertainty and potential chilling effect generated by OSP terms of service is heightened by technological nudges that are woven into most platform architecture.<sup>24</sup> These technological nudges encourage users to share and promote content that, as a result of confusing terms of service, could potentially result in infringement. Caraban et al set out that:

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<sup>18</sup> M Patton, “How to Protect Users’ Copyright Rights in the Age of Social Media Platforms and Their Unread Terms of Service” [2019] 53(3) University of San Francisco Law Review 463-471

<sup>19</sup> M Heins, “The Brave New World of Social Media Censorship” [2013] H.L.R.F. 127, 325-328

<sup>20</sup> J Obar, A Oeldorf-hirsch, “The biggest lie on the Internet: ignoring the privacy policies and terms of service policies of social networking services” [2018] 23 Information, Communication and Society 128

<sup>21</sup> C Fiesler et al, “Reality and Perception of Copyright Terms of Service for Online Content Creation” [2016] 11

<sup>22</sup> M Kretschmer, “UK Authors’ Earnings and Contracts 2018: A survey of 50,000 writers” [2019] 43

<sup>23</sup> S Humphreys, “The challenges of intellectual property for users of Social Networking Sites: a case study of Ravelry.” [2008] In Proceedings Mind Trek, Tampere, Finland.

<sup>24</sup> For example, on YouTube, when uploading, a user who selects the ‘upload’ button will be directed to editing mechanisms that enable a user to cut and edit using other videos on the site. Facebook utilises a convenient share button, but the audience that can view the original post once shared, is dependent on several factors, including; whether the post is shared to the users own timeline or a friend, the social reach of the user, and the subsequent social reach of any friends who can view the original post.

These nudges facilitate decision-making by diminishing individual's physical or mental effort. They are designed to encourage people to intuitively pursue a predefined set of actions, which resemble people's best interests and goals.<sup>25</sup>

In the context of OSPs such technological nudges create conflicting expectations relating to the exclusive rights of copyright holders. For example, the right to reproduction, a fundamental right, "is frequently violated on social media sites- this is because many of the technological features on the sites essentially allow users conveniently to copy some part of the original content."<sup>26</sup> Platforms such as YouTube, Twitter and Facebook seek to encourage generative behaviour, so that they can maximise valuable content output. On the other hand, within dense terms of service, these platforms simultaneously discourage any content creation that is not entirely respectful of copyright. By utilising technological nudges, OSPs emphasise the unfair balance of power between that of the user, and the intermediary, by exposing the user to a higher risk of both infringement and uncertainty through mixed signals.<sup>27</sup> By fostering this uncertain milieu, OSPs risk blurring the lines of copyright enforcement and protection, leaving users (a) unable to effectively wield copyright in their original content and (b) at higher risk of reproducing copyright protected content without permission from the original owner.

## 2.2. The 'Value Gap'

The Internet, and in particular online platforms such as Spotify, YouTube, Facebook, Twitter, or Pinterest, have become the main arena for the upload, dissemination, and exploitation of vast swathes of (potentially copyright protected) media content. OSPs benefit from user-generated content, utilising it to increase the value of their content environment, attract more users, their data, and subsequent advertisement exposure.<sup>28</sup> Whilst UGC is a major source of revenue, some parties have identified a "growing concern about the equitable sharing of the value generated by some of the new forms of online content distribution along the value chain".<sup>29</sup> This is highlighted by the advent of Article 17 of the Directive on Copyright in the Digital Single Market (CDSM), which stemmed from certain opinions, such as the IFPI,<sup>30</sup> who suggest that indeed creators are not being fairly remunerated (In the classical copyright sense of just royalties) for the use of their

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<sup>25</sup> A Caraban et al, "23 Ways to Nudge: A Review of Technology-Mediated Nudging in Human-Computer Interaction" [2019] Proceedings of CHI Conference on Human Factors in Computing Systems

<sup>26</sup> C H.Y. Tan, "Technological Nudges and Copyright on Social Media Sites" [2015] I.P.Q. 1, 62-74

<sup>27</sup> Ibid. 62-75

<sup>28</sup> M Stedman, "Mind the Value Gap, Article 17 of the Directive on Copyright in the Single Digital Market" [2019] 7

<sup>29</sup> Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions – Promoting a fair, efficient, and competitive European copyright-based economy in the Digital Single Market [2016] 7

<sup>30</sup> IFPI Global Music Report [2017] 25

content and that there is a “distorted distribution of revenue”.<sup>31</sup> If this was the case then OSPs would be undermining copyright’s functionality; creators would be making less money than they should, and therefore more and more artists will have been discouraged from entering the industry, or risking innovation.

### *2.2.1. Lowering Cost of Production, Dissemination and Advertising*

However, contrary to the view that digitisation and technology such as OSPs have resulted in a value gap, and an overall detriment to creator income or creativity, there is evidence to show that the development of new technology has made it both easier and cheaper for innovators to produce, distribute, and advertise their work, thereby actually increasing the number of works being created. Waldfogel states that:

Digitization has offered low-cost alternatives to many of the steps in bringing products to market. Production is now far less expensive. An artist can create a passable recording with an inexpensive microphone and the software on a computer or even a smart-phone. Distribution can be entirely digital...Moreover, artists have opportunities to promote their work outside terrestrial radio, using YouTube, or online radio services such as Spotify and Pandora.<sup>32</sup>

Coinciding with the democratisation of production, advertising, and distribution, platforms gather data on subsequent sales or streams, which enables a more precise distillation of what consumers enjoy.<sup>33</sup> Consequently, the impact is that more creative products are available, and the risk that a creative work will not find an audience is reduced, “perhaps markedly, when audience tastes can be discerned and monitored over time and content finely calibrated to push the right buttons.”<sup>34</sup> This evidence suggests that digitisation and OSPs have been a boon to the creation and dissemination of creative products, whilst also reducing the risk that content will fall by the wayside. Platforms such as YouTube can increase sales of music by approximately 20% and are once again unaffected by UGC.<sup>35</sup> This would suggest that technology, including

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<sup>31</sup> C Angelopoulos, “On Online Platforms and the Commission’s New Proposal for a Directive on Copyright in the Digital Single Market” [2017] CIPIL 3, D Lawrence, “Addressing the Value Gap in the Age of Digital Music Streaming” [2019] 52 V.J.T.L. 2, 512-514

<sup>32</sup> J Waldfogel, “How Digitisation Has Created a Golden Age of Music, Movies, Books and Television” [2017] 31 Journal of Economic Perspectives 3, 195 - 199

<sup>33</sup> F Shao et al, “The Establishment of Data Analysis Model about E-Commerce’s Behaviour Based on Hadoop Platform” [2018] International Conference on Intelligent Transportation, Big Data and Smart City, 436, M Mariani, S Wamba, “Exploring How Consumer Goods Companies innovate in the Digital Age: The Role of Big Data Analytics Companies” [2020] J.B.R. 121, 338

<sup>34</sup> K Raustiala and C J Sprigman, “The Second Digital Disruption: Streaming and The Dawn of Datadriven Creativity” [2019] 94 New York University Law Review, 1555-1621

<sup>35</sup> M Kretschmer, C Peukert, “Video Killed the Radio Star? Online Music Videos and Recorded Music Sales” [2017] CEP Discussion Paper No.1265

OSPs, is a boon to the functionality of copyright in encouraging creativity and availability of quality content to the public.<sup>36</sup>

### *2.2.2. Decrease in Copyright Protection Strength*

As highlighted above, along with the development of OSPs, came a decrease in the cost of producing, sharing, and advertising, which has resulted in a reduction in the revenue available for all digital creations. This has led to a reduction in strength of copyright protection.<sup>37</sup> Advocates of classic copyright justifications may argue that the decrease in copyright protection strength will invariably lead to a decrease in copyright functionality, as innovation requires robust protection to navigate a competitive market, and to encourage further creativity.

However, research indicates that even though copyright protection has decreased alongside the development of digitisation and OSPs, overall, users are creating more quality content than ever.<sup>38</sup> Handke et al, find that substantially more creative works have been released in recent years than before the rise of digital technology such as streaming and file-sharing.<sup>39</sup> Following traditional copyright justifications, a reduction of copyright protection strength, alongside the rise of amateur content creation, would undermine the demand for professional content. Converse to this, evidence shows that in fact, "The growing dissemination and consumption of UGC demonstrates that these types of works are of considerable value, adding to professional content."<sup>40</sup> What this shows is that digital technology has had a positive impact on the supply of new creative works, and has not had a negative impact on innovation in spite of weakened copyright protection strength. Moreover, the surge in new content has not displaced other areas such as the professional market. In fact, it seems that with OSPs facilitating a ubiquity of quality content, and as expected return on investment becomes more secure alongside greater data driven accuracy, piracy decreases and therefore whilst the strength of copyright protection is weakened, the need for copyright protection is also lowered. Nevertheless, if the strength and need of copyright protection is weakened, does this necessarily entail that copyright functionality is undermined?

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<sup>36</sup> J Waldfogel, "How Digitisation Has Created a Golden Age of Music, Movies, Books and Television" [2017] 31 *Journal of Economic Perspectives* 3, 195

<sup>37</sup> J Waldfogel, "Copyright Protection, Technological Change, and the Quality of New Products: Evidence from Recorded Music Since Napster" [2011] *National Bureau of Economic Research* 1

<sup>38</sup> C Handke et al, "Copyright and innovation: Fit for digitization?" [2015] 5 *Deutsches Institut für Wirtschaftsforschung* 16, 223-226

<sup>39</sup> *Ibid.*

<sup>40</sup> *Ibid.* 229

On the contrary, research shows that overly strong copyright protection can act as a barrier for knowledge, raising the cost of access, and therefore undermining copyright functionality by limiting access to information or work that could spur creativity and innovation.<sup>41</sup> John Barlow predicted that the value of intellectual property would be found in its relationship to the online market and “underlying everything, the ability of that market to access your creative services swiftly, conveniently, and interactively.”<sup>42</sup> Following this idea, research seems to suggest that rather than focusing on strict, narrow copyright protection, countries’ levels of innovation may benefit from more broad copyright measures such as the expansion of user rights.<sup>43</sup> Palmedo and Flynn conducted empirical evidence which showed that “greater openness in copyright user rights is associated with positive outcomes.”<sup>44</sup> Scholarly evidence would therefore suggest that a weaker form of copyright protection does not necessarily undermine the core functionality of copyright. Indeed, weaker protection, which OSPs facilitate, may lower barriers to access of information and encourage higher rates of creativity or innovation, thereby decreasing the value gap, rather than widening it.

### 2.3. Online Service Providers and Copyright Moderation

Over time there has been a rapid increase in the amount of notice and takedown requests (N&TD) requested and actioned by rightsholders and OSPs respectively, and this points to robust, arguably successful use of a system that seeks to protect copyright.<sup>45</sup> However, research also suggests that along with the massive volume of takedown notices there comes a risk to freedom of speech, of access to knowledge.<sup>46</sup> Free speech and access to knowledge suffers when non-infringing content is taken down because of malicious takedown notices or as part of a sweeping, often inaccurate, robo-notice system employed by many large rightsholders, and this is exaggerated in countries that do not constitutionally enshrine freedom of speech, and/or

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<sup>41</sup> B Biasi, P Moser, “Effects of Copyrights on Science: Evidence from the WWII Book Republication Program” [2018] NBER Working Paper No. w24255

<sup>42</sup> J P Barlow, “The Economy of Ideas A framework for patents and copyrights in the Digital Age (Everything you know about intellectual property is wrong)” (WIRED, 03/01/1994) <<https://www.wired.com/1994/03/economy-ideas/>> accessed 6 July 2021

<sup>43</sup> S Jacques et al, “The Impact on Cultural Diversity of Automated Piracy Systems as Copyright Enforcement Mechanisms: An Empirical Study of YouTube’s Content ID Digital Fingerprinting Technology” [2017]

<sup>44</sup> S Flynn, M Palmedo, “The User Rights Database: Measuring the Impact of Copyright Balance” [2019] Working Papers 42

<sup>45</sup> J M Urban, L Quilter, “Efficient Process or ‘Chilling Effects’? Takedown Notices Under Section 512 of the Digital Millennium Copyright Act” [2006] 22 Santa Clara High Tech. L.J. 4, 621 – 647, D Seng, “The State of the Discordant Union: An Empirical Analysis of DMCA takedown notices” [2014] 18 Va. J. L. & Tech 369

<sup>46</sup> W Seltzer, “Free Speech Unmoored in Copyright’s Safe Harbour: Chilling Effects of the DMCA on the First Amendment” [2010] 24 Harv. J.L. & Tech. 171

do not utilise the doctrine of fair use. Empirical data from Bar-Ziv and Koren looking at 9,890 takedown requests revealed that, "Even among the copyright-related removal requests, in some cases, the targeted content was not necessarily infringing."<sup>47</sup> Further, Kretschmer and Erickson looked at 1,839 music video parodies that, as transformative works, should fall under exceptions to copyright infringement.<sup>48</sup> Their research highlighted that over the course of four years, 606 of the works had been taken down for copyright related reasons.<sup>49</sup> Such data may be indicative of a significant threat to potentially innocent content, and as automatic enforcement lacks the ability to separate legitimate requests from requests unrelated to copyright, both misuse, and a bias towards takedown, are a clear threat. <sup>50</sup>Removal of innocent content has potentially serious implications to freedom of speech and access to knowledge, which in turn will have a detrimental effect on the legitimate re-use of material and the creation of new, innovative works; with a subsequently detrimental effect on the goals of copyright to facilitate creativity and public access to resulting works.

### *2.3.1. Lack of Pushback*

Another potentially copyright undermining characteristic of OSPs' technological approach to content moderation is that there appears to be an under-assertion of counter- notices. Bridy and Keller identified that the small amount of counter notices being utilised by users are "dwarfed by the portion of dubious DMCA removal requests that researchers have identified."<sup>51</sup> Indeed, the rate of creator counter-notices disputing takedown measures is often less than 1%.<sup>52</sup> Potential reasons for this could be due to a combination of confusion, intimidation, or high legal risk.<sup>53</sup> The resulting low rate of counter notice assertion is indicative of the imbalance of power between that of a user and the sender of take down notices, an imbalance that is facilitated by OSPs automatically actioning notices within minutes yet taking days to action counter- notices.<sup>54</sup> OSPs' attitude to counter-notices highlights that they are more concerned

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<sup>47</sup> S Bar-Ziv, N Elkin-Koren, "Behind the Scenes of Online Copyright Enforcement: Empirical Evidence on Notice and Takedown" [2017] 50 C.L.R. 2, 37

<sup>48</sup> K Erickson, M Kretschmer, "This Video is Unavailable: Analysing Copyright Takedown of User-Generated Content on YouTube" 9 J.I.P.I.T.E.C. 1

<sup>49</sup> Ibid.

<sup>50</sup> J M Urban, B L Schofield, & J Karaganis, "Takedown in Two Worlds: An Empirical Analysis. Journal of the Copyright Society of the USA" [2017] 64 J. Copyright Society 4, 483-520

<sup>51</sup> A Birdy, D Keller, "U.S. Copyright Office Section 512 Study: Comments in Response to Second Notice of Inquiry" [2015] 28

<sup>52</sup> Ibid.

<sup>53</sup> L Fiala, M Husovec. "Using Experimental Evidence to Design the Optimal Notice and Takedown Process" [2018] TILEC Discussion Paper No. 028

<sup>54</sup> J Urban, J Karaganis, B Schofield, "Notice and Takedown in everyday practice." [2017] UC. Berkeley Law Research Paper No. 2755628, 45

about the liability for restoring material than they are about leaving it down.<sup>55</sup> In conjunction with the rise of often inaccurate ‘robo-notices’ the lack of fightback from the average user further characterises the notice and takedown procedure, and its subsequent application by OSPs, as a potentially potent tool for censorship. One that when abused, could certainly undermine the goals of both the DMCA from which it is wrought, and fundamental tenets of copyright.

### *2.3.2. In Spite of Flaws*

As commented on above, there are numerous flaws within the notice and takedown system and how it is applied by OSPs. However, the literature appears to suggest that overall, the N&TD regime is working. A vast number of takedown notices are being utilised by rightsholders; subsequently being actioned by OSPs and therefore, “despite its flaws, the notice-and-takedown regime is working.”<sup>56</sup> Kretschmer and Erickson argue that the whilst the flaws in the N&TD regime present valid points of potential exploitation, the likelihood of such exploitation is perhaps overstated, “The distribution of cost burdens creates incentives for rightsholders to pursue instances of straight piracy, while user-generated re-use remains largely tolerated.”<sup>57</sup> Research conducted by Heald supports this argument by demonstrating that N&TD, in conjunction with OSP technology such as YouTube’s ContentID system, can “initiate a stream of profits, circumventing the normally high transactions costs associated with music listening.”<sup>58</sup> When a user uploads a work, YouTube contacts the copyright owner who can subsequently choose to monetise the video and collect advertising revenue from it. Thus, N&TD regimes combined with OSP technology can create a market for works previously outside the scope of commercial viability. In spite of its flaws therefore, OSPs’ application of the N&TD system, alongside their own automatic detection systems, appears to fulfil the goal of providing robust protection for rightsholders’ content from piracy, whilst simultaneously creating markets for the re-use of out- of -commercial material. Thus, protecting and re-invigorating the content available for both the public and aspiring creators alike.

## 2.4. Chapter Summary Analysis

Online service platforms as a technological advancement, and the subsequent technologies spawned from them, have facilitated the creation of what some have called a golden era of

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<sup>55</sup> Ibid.

<sup>56</sup> K Erickson, M Kretschmer, “Empirical Approaches to Intermediary Liability” [2019] CREATE Working Paper, 19

<sup>57</sup> Ibid. 1

<sup>58</sup> P J Heald, “How Notice-and-Takedown Regimes Create Markets for Music on YouTube: An Empirical Study”. [2014] University of Illinois College of Law, 6

creative production. The digital technology developed by such platforms has reduced the cost of advertising, production, and dissemination of creative works, effectively democratising entire creative industries. As a result of this reduction in cost, there has been more creative content generated than ever before, and furthermore, evidence suggests that this surge in production has not displaced already established markets or desires, such as the market for professional work.

The subsequent reduction in cost has resulted in an overall decrease in the revenue available for any given digital product, and consequently, a reduction in copyright protection strength. Classical justifications for copyright would suggest that this must necessarily mean that OSPs, by their nurturing of such a market, are undermining the functionality of copyright, as strong protection is needed for robust market competition. However, evidence shows that this is not the case, and in fact, technology and data cultivated by OSPs has allowed not only an increase in the amount of content being produced, but likewise an increase in the commercial security of such content via consumer consumption analytics. The subsequent impact of increased output and certainty of revenue reduces piracy, and so whilst copyright protection strength is decreased, so too is its need.

It is arguable then that OSPs do undermine the classical approach to copyright; however, the evidence would suggest that an environment with weaker copyright protection will act as a fertile ground for creativity and innovation, by lowering the time/economic cost of producing content and accessing information.

On the other hand, most OSPs are profit-orientated and commercial above all else, their *raison d'être* is not to act as a free playground for innovators, but rather to extract value from user content. This is manifestly true when looking at OSP use of broad automatic licences, dense legalese, and subversive technological nudges. All three are utilised so that OSPs can exert commercial control over user content, to maximise the value gained from creators who, once unwittingly agreeing to sub-license their content to a third party, may not earn a deserved portion of the revenue. It is through the subversive use of commercial tactics to control both the user and their content that we see OSPs undermine the functionality of copyright. Creating an environment of confusion and mixed signals encourages users to assume a 'better safe than sorry' attitude to uploading, whilst simultaneously increasing their risk of copyright infringement, thereby applying a chilling effect to creativity and innovation.

Similarly, issues with OSPs undermining the functionality or goals of copyright arise with their need for control and how they apply the N&TD regime. With the advent of large swathes of robo-

notices, combined with often inaccurate auto-detection technology, OSPs display a bias towards the taking down of content rather than its restoration. As a result of these factors, a significant number of potentially innocent productions are removed. This has clear implications for free-speech, access to information and overall creativity; matters compounded by the distinct lack of counter-notices being used by alleged infringers.

However, overall, evidence suggests that the N&TD system, as applied by OSPs, is doing its job effectively. Apart from its flaws, large quantities of notices are being used to protect rightsholders' copyright, decreasing piracy whilst simultaneously leaving UGC largely intact. Furthermore, by combining the N&TD regime with in-house technology, OSPs such as YouTube can potentially promote re-use of old content through efficient low-cost licences.

Online Service Platform technology, and whether it represents a threat to copyright, is similar to the application of the N&TD regime; there are serious flaws that need to be considered, represented by the creation of overly broad licences, tech-nudging, and the removal of innocent content. These are real issues that have the potential to instil fatalism in users and chill creativity. However, the literature suggests that whilst these are problems that require fixing, overall OSP technology does not critically undermine the goals of copyright or its functionality. In fact, by effectively distributing the costs of production, dissemination, advertising, and enforcement, OSPs have arguably enshrined many of copyright's goals by propelling the creation of innovative works, increasing content revenue certainty, invigorating re-use, and improving public access.

### **Chapter 3 – Blockchain Technology**

Blockchains are tamper evident and tamper resistant digital ledgers implemented in a distributed fashion (i.e., without a central repository) and usually without a central authority (i.e., a bank, company or government). At their basic level, they enable a community of users to record transactions in a shared ledger within that community, such that under normal operation of the blockchain network no transaction can be changed once published.<sup>59</sup>

Blockchains are composed of imbedded blocks of meta-data that are cryptographically chained to one another.<sup>60</sup> These cryptographic links require validation via a consensus; as one block is validated, the previous blocks become more difficult to alter.<sup>61</sup> Each copy of the ledger across

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<sup>59</sup> D Yaga et al, "Blockchain Technology Overview" [2018] NISTIR 8202, 1

<sup>60</sup> M Pilkington, "Chapter 11: Blockchain technology: principles and applications." in F Olleros et al, Research Handbook on Digital Transformations (Elgaronline 2016) 225-226

<sup>61</sup> Ibid.

a given network replicates new blocks, and the manner in which the blockchain operates is set by its underlying protocols, which resolve automatically.<sup>62</sup>

Users of a blockchain are held accountable to these protocols, and by means of public timestamping, blockchain ensures that transparent validation takes place.<sup>63</sup> Validation is performed by information provided to other users, and if subsequent information does not match, then the verification fails, yet all relevant information remains available to anyone who wishes to view it.<sup>64</sup>

### 3.1. Can Blockchain assist with Creator Content Control?

The potential application of blockchain technology in enhancing/safeguarding the functionality/goals of copyright is highlighted against several of the current challenges presented by Online Service Providers, one of the main issues being that users, and subsequently creators, face uncertainty with regard to the dissemination and revenue control of their content.<sup>65</sup> This is due to a number of reasons; one of the most significant being the overly broad licences utilised by the majority of large OSPs, and the resulting sub-licences that branch from these.<sup>66</sup> Users who agree to such licences, which are often included as part of dense, confusing terms of service, have little to no control over the subsequent dissemination of their work, and as such can miss out on, or fail to grasp the extent of their content value.<sup>67</sup> Further, in many instances, creators or rightsholders do not receive data on when or how their works are used once they are sub-licensed, which further obfuscates their ability to accurately or confidently assess the value of the content they are producing.<sup>68</sup> Blockchain can assuage this issue by providing fertile ground for secure smart contracts in the form of distributed architecture, immutability and auditability.<sup>69</sup> Smart contracts which can be used, "for transactions made directly between the contracting parties without the need for a trusted third

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<sup>62</sup> F Batubara et al, "Unravelling Transparency and Accountability in Blockchain" [2019] Proceedings of the 20th Annual International Conference on Digital Government Research, 204 - 206

<sup>63</sup> BitFury, "White Paper on Blockchain Audibility" [2016] 9

<sup>64</sup> Ibid.

<sup>65</sup> M Patton, "How to Protect Users' Copyright Rights in the Age of Social Media Platforms and Their Unread Terms of Service" [2019] 53 University of San Francisco Law Review 3, 463-471

<sup>66</sup> B Van Alsenoy et al, "From social media service to advertising network: A critical analysis of Facebook's Revised Policies and Terms" [2015] 43

<sup>67</sup> M Patton, "How to Protect Users' Copyright Rights in the Age of Social Media Platforms and Their Unread Terms of Service" [2019] 53 University of San Francisco Law Review 3, 463-471

<sup>68</sup> Rethink Music, "Fair Music: Transparency and Payment Flows in the Music Industry" [2015] 3

<sup>69</sup> F Batubara et al, "Unravelling Transparency and Accountability in Blockchain" [2019] Proceedings of the 20th Annual International Conference on Digital Government Research, 204 - 205

party to supervise and verify the transactions.<sup>70</sup> Subsequently, transferring rights utilising blockchain and smart contracts could enable rightsholders to; directly transfer rights to other users, set licence parameters, accurately control pricing and track content usage data.<sup>71</sup> Through Spotify, it could take hundreds of streams for rightsholders to receive even a penny for their work. <sup>72</sup>If utilised correctly, smart contracts, facilitated by blockchain, could recalibrate the power of the content creator by placing the control of their revenue back in their hands, potentially even removing the need for third party intermediaries altogether; thereby not only protecting the incentive/reward function of copyright, but further broadening secondary markets for the re-use of digital content.<sup>73</sup>

Whilst blockchain could therefore theoretically displace the need for intermediaries such as CMOs and OSPs, more likely is the reality that it will alter the roles of certain intermediaries and redistribute some bargaining power back to users.<sup>74</sup>As highlighted above, blockchain could affect this redistribution via immutable data and the facilitation of secure smart contracts. A further benefit of blockchain, and one that could facilitate the functionality and goals of copyright for *both user and intermediaries alike*, would be the creation of an immutable, transparent, and decentralised Rights Management Information (RMI) database of copyrighted work and related rights.<sup>75</sup>

### 3.2. Global Repository of Rights Management Information

To date, there have been several failed attempts to create a global repository of RMI, such as the International Music Joint Venture and the International Music Registry.<sup>76</sup> A primary contributing factor to the failure of these global registries is the requirement of trust and lack of

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<sup>70</sup> S Pech, "Copyright Unchained: How Blockchain Technology can Change The Administration and Distribution of Copyright Protected Works" [2020] 18 Nw.J.T&IP. 1, 36

<sup>71</sup> Ibid.

<sup>72</sup> R Takahashi, "How can creative industries benefit from blockchain?" [2017] <<https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/how-can-creative-industries-benefit-from-blockchain>> accessed 8 August 2021

<sup>73</sup> A Savelyev, "Copyright in the Blockchain ERA: Promises and Challenges" [2017] HSE Research Paper No. WP BRP77/LAW/2017 10

<sup>74</sup> M Finck, V Moscon, "Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0" [2019] I.I.C. 50, 77-95

<sup>75</sup> M O'Dair, R Owen, "Monetizing New Music Ventures through blockchain: Four Possible Futures?" [2019] 20 I.J.E.I. 4, 263-264

<sup>76</sup> K Milosic, "The Failure of the Global Repertoire Database" [2015] Berklee College of Music (<http://www.thembj.org/2015/08/grds-failure/>), S Pech, "Copyright Unchained: How Blockchain Technology can Change The Administration and Distribution of Copyright Protected Works" [2020] 18 Nw.J.T&IP. 1, 9

incentive to share between sources of rights management information.<sup>77</sup> However, as highlighted above, blockchain has the benefit of being transparent and immutable, and as such nullifies the need for trust between intermediaries. Non-interoperable databases of information represent obstacles to data-sharing and promote conflict in relation to ownership, such as duplicate claims or inaccurate attribution across multiple rightsholders.<sup>78</sup> Consequently, transactional costs are high, and revenue distribution to creators is inefficient.<sup>79</sup> As it stands, therefore, the RMI databases used by intermediaries and OSPs alike are sub-optimal and undermine the functionality of copyright. However, creation of a blockchain-based database of RMI would kickstart the process of untangling problematic asymmetrical information databases.<sup>80</sup> A global blockchain-based registry will thus benefit OSPs and other intermediaries by removing barriers to data-sharing, allowing smoother trading of rights whilst minimising inefficient gaps in RMI relating to ownership in a competitive and dense market. For users and creators such a register would likewise assist in providing increased certainty in both revenue distribution, and the acquisition of licences, thus being able to earn and create more fluidly and assuredly; if there are several rightsholders, the ownership data can be tracked more effectively, and subsequent smart contracts would be able to split revenues between them.

As part of creating a secure registry that allows efficient and secure storage of RMI, a blockchain utilises hash functions, which create a digital fingerprint for selected data. A creator can acquire a unique digest of their work and:

Two digests can be the same only if the initial data is the same: minor differences will lead to a different hash amount...As a result, information about copyright ownership and its subsequent changes with relevant timing is integrated on a blockchain and cannot be forged<sup>81</sup>

Outside of blockchain technology there are other solutions to the issue of proving ownership, one of the most prominent being Google's ContentID system, which likewise creates a digital fingerprint from metadata uploaded by users, and scans other uploaded videos against this fingerprint to check for matching content.<sup>82</sup> Blockchain improves upon this system, however, by

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<sup>77</sup> A Savelyev, "Copyright in the Blockchain ERA: Promises and Challenges" [2017] HSE Research Paper No. WP BRP77/LAW/2017 5

<sup>78</sup> M O'Dair, "How Blockchain Technology Can Monetize New Music Ventures: An Examination of New Business Models" [2020] 21 J.R.F. 4, 333-340

<sup>79</sup> Ibid.

<sup>80</sup> M O'Dair, "How Blockchain Technology Can Monetize New Music Ventures: An Examination of New Business Models" [2020] 21 J.R.F. 4, 333-340

<sup>81</sup> A Savelyev, "Copyright in the Blockchain ERA: Promises and Challenges" [2017] HSE Research Paper No. WP BRP77/LAW/2017 8

<sup>82</sup> L Shinn, "Youtube's Content ID as a Case Study of Private Copyright Enforcement Systems" [2015] 43 A.Q.J. 2, 359-370

removing the need for trust; platform fingerprint technology is designed to engage with liability exemptions, and therefore is inherently dependent on the specific policies of each platform. Consequently, unilaterally decided terms of service can alter the parameters of fingerprint-based moderation at any time, moving the goalposts for users without including them in the process. With blockchain, databases are decentralised, with terms imbedded within the code of the blockchain.<sup>83</sup> Thus there would be no dependence on potentially capricious platform policy, and subsequent changes would require a consensus.<sup>84</sup> Through the creation of a transparent blockchain database, therefore, copyright would be enhanced, for users and OSPs alike, as rights clearance would become more effective, and users could quickly check to see if a specific work is still in copyright, and thus engage in the act of legitimate derivative creation more assuredly. Further, due to the immutable and decentralised nature of the blockchain, users can trust that the terms setting out the parameters of the blockchain will only change with collective agreement, thereby fortifying the longevity of potential creative output that is facilitated by OSPs who adopt blockchain technology, or alternate blockchain based service providers such as Ujo Music.<sup>85</sup>

### 3.3. Garbage In, Garbage Out

Whilst the immutability of a blockchain-based system of copyright management is generally viewed as one of the substantial benefits of using blockchain technology, immutability can become a problem if inaccurate data is uploaded. Whether the blockchain is private or public, anyone with access can register their work, and if subsequent information is wrong, accidentally, or maliciously, then the blockchain begins to suffer from the 'garbage in, garbage out' problem.<sup>86</sup> Blockchain technology cannot exert *ex ante* control on the quality of input information, and once uploaded, actors on the blockchain will be limited in their ability to assess the accuracy of entered data. Blockchains are specifically very vulnerable to the 'garbage in, garbage out' issue precisely due to the technology's immutable nature, as "immutability extends the longevity of data of poor quality. In addition, users may avoid entering data as they could be held liable for wrongful entries".<sup>87</sup> This problem could undermine the functionality of copyright for both users and authors; authors may become subject to inaccurate claims, with no ability to

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<sup>83</sup> T Tam, "Music Copyright Management on Blockchain: Advantages and Challenges" [2019] 29 A.L.J.S.T. 3, 201-213

<sup>84</sup> R Beck et al, "Blockchain Technology in Business and Information Systems Research" [2017] 59 B&I.S.E. 381

<sup>85</sup> Ujo Music (<https://blog.ujomusic.com/>)

<sup>86</sup> M Janssens, J Vanherpe, "Blockchain and Copyright: Beyond the Buzzword?" [2018] I.R.D.I. 2, 93-102

<sup>87</sup> R Ziolkowski et al, "Decision Problems in Blockchain Governance: Old Wine in New Bottles or Walking in Someone Else's Shoes?" [2020] 37 J.M.I.S. 2, 316-328

takedown requests as there is generally no central authority within a blockchain.<sup>88</sup> Users can be exposed, as innocently uploading inaccurate data could result in an immutable case for liability. Indeed, even in the event that a court finds that a work does not qualify for copyright protection, it is not clear as to how data already input into a blockchain may be completely rectified.<sup>89</sup> The danger of the 'garbage in, garbage out' issue is that it could turn the indelible nature of the blockchain against itself; instead of acting as a strong platform of evidentiary RMI, it could facilitate the creation of a quagmire of inaccuracy, a catalogue of inefficiency, and a barrier therefore to effective management of copyright. Potentially doubling down on the problem of inaccurate data presented by current databases, but unlike a block-chain based system, OSPs and other intermediaries can remove flagged data inaccuracies readily, with relatively low costs to efficiency.<sup>90</sup>

As mentioned above, smart-contracts are desirable due to their efficiency in auto-enforcement and use of the blockchains digital ledger. However, this does mean that, lacking inbuilt controls, any flexibility in relation to a given smart-contract is removed, there is no leeway for human decision making in the exercise of enforcement.<sup>91</sup> This characteristic, combined with the potential for abuse via external actors such as hackers, corporations seeking to manipulate normative behaviour, those who write the underlying code for the blockchain, or even general users creating their own smart- contracts, means that the 'if-then' rules of a smart-contract can create loopholes for abuse or inefficiency.<sup>92</sup> Taking the example of an innocent user, creating a smart- contract in order to transfer certain rights, a smart-contract cannot cover every conceivable eventuality or unforeseen circumstance that may arise and create issues.<sup>93</sup> In the event of such circumstances, the lack of smart-contract flexibility, combined with blockchain technology's fundamental core of immutability, means that flawed transactions cannot be changed once executed.<sup>94</sup> The potential for an irreversible mistake may illicit uncertainty amongst users, especially those who are less technically proficient.

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<sup>88</sup> M Janssens, J Vanherpe, "Blockchain and Copyright: Beyond the Buzzword?" [2018] I.R.D.I. 2, 93-102

<sup>89</sup> Ibid.

<sup>90</sup> K Erickson, M Kretschmer, "Empirical Approaches to Intermediary Liability" [2019] CREATE Working Paper, 19

<sup>91</sup> K Levy, "Book-Smart, Not Street Smart: Blockchain-based Smart Contracts and The Social Workings of Law" [2017] Engaging Science, Technology and Society 3, 1-10

<sup>92</sup> M Russon, "Cryptocurrency heist hacker returns \$260m in funds" (BBC, 12/08/2021) <<https://www.bbc.co.uk/news/business-58180692>> accessed 15 August 2021

<sup>93</sup> J Sklaroff, "Smart Contracts and the Cost of Inflexibility" [2017] 166 U.P.L.R. 263-277

<sup>94</sup> M Vatiéro, "Smart Contracts and Transaction Costs" [2018] Discussion Paper .238, 13

However, one aspect of this pressure may benefit innovators or creators seeking to utilise smart-contracts, in forcing contracting-parties to craft their smart-contracts with precision and as much foresight as possible, empowering potential innovators to interact immersively with the agreements so that they can then be used to wield their intellectual property more effectively.

Current databases already engage with erroneous information, and this is combined with non-interoperability, so a global blockchain repository of information would still improve the clarity and coherence of RMI, but it will require external use of algorithms and A.I. in order to alleviate the impact of 'garbage in, garbage out' data.<sup>95</sup> This will introduce additional costs to the operation of a system utilising blockchain, but could potentially be carried by users, balanced against the efficiency of blockchain transfers, which will lower overall transaction costs, and allow greater direct revenue control.<sup>96</sup>

### 3.4. The Network Problem

Another downside to one of the prospective benefits of blockchain, its decentralised nature, is that it requires active users and rightsholders to expand its network in order to maximise security and efficiency.<sup>97</sup> The value of a blockchain system therefore depends on how many people use it. Moreover, "Owing to the use of cryptography and dissemination over the network, data stored on a blockchain are highly tamper-resistant but are still not completely immune to alteration."<sup>98</sup> If a hacker was to control a majority of the computational power, (also known as a 51% attack) they may be able to alter data on the blockchain.<sup>99</sup> Due to the nascent nature of blockchain technology, the number of blockchain ready users remains relatively small. Indeed, many contemporary examples of blockchain-based copyright models have not seen widespread success. For example, Imogen Heap released her song *Tiny Human* utilising blockchain technology, and accepted that the experiment, whilst only acting as a stepping stone and an example for future artists, had not dented the status quo of the industry significantly, and that

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<sup>95</sup> J Silver, "Blockchain or the Chaingang? Challenges, Opportunities and Hype: The Music Industry and Blockchain Technologies" [2016] CREATE Working Paper 2016/05, 44

<sup>96</sup> S Pech, "Copyright Unchained: How Blockchain Technology can Change The Administration and Distribution of Copyright Protected Works" [2020] 18 Nw.J.T&IP. 1, 22

<sup>97</sup> V Gatteschi et al, "Blockchain and Smart Contracts for Insurance: Is the Technology Mature Enough?" [2018] 10 Future Internet 20, 3

<sup>98</sup> S Pech, "Copyright Unchained: How Blockchain Technology can Change The Administration and Distribution of Copyright Protected Works" [2020] 18 Nw.J.T&IP. 1, 17

<sup>99</sup> D Efanov et al, "The All-Pervasiveness of the Blockchain Technology" [2018] Procedia Computer Science 123, 116-119

there is still only a small minority of users literate in blockchain technology.<sup>100</sup> Without substantial user interaction or content presence, the potential of blockchain will remain unrealised. On the other hand, OSPs are arguably perfectly placed to embrace blockchain systems, and take advantage of the security, accuracy, trust, and efficiency it potentially has to offer.<sup>101</sup> In return, OSPs could provide a fertile ground for blockchain development with influence over millions of users, and years of experience in turning complex nascent consumer-facing technology into universally accessible formats.

### 3.5. Regulatory power of Blockchain

Lawrence Lessig explains in 'Code and Other Laws of Cyberspace' that digital code has significant regulatory power which can be used to control the normative behaviour of users in a similar manner to legislated law.<sup>102</sup> As highlighted in the previous chapter, OSPs can utilise terms of service as flexible means of controlling user content, and this can undermine the functionality of copyright as users are subject to capricious parameters of creation, rights dissemination, and infringement. Therefore, innovators can end up deciding to err of the side of 'better safe than sorry' and to simply not create or innovate at all. Blockchain technology does have the capacity to create a fairer, transparent, consensus-based system of administering and sharing copyright and related rights; however, similarly to OSPs' designated terms of service, which can act as unlegislated policy levers, blockchains and smart-contracts can potentially be used to enforce normative choices on behalf of private interests.<sup>103</sup>

Protocols imbedded in the blockchain will form the underlying basis for enforcing the normative parameters set by the creators of the blockchain.<sup>104</sup> By embedding certain value principles, the protocol architecture will set the terms on which the blockchain will be used and therefore define what is and what is not possible within a particular blockchain system. Then, smart-contracts will further influence the decisions and normative value-judgements of users, as smart-contracts are self-enforcing and therefore automatically comply with the underlying

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<sup>100</sup> J Bartlett, "Imogen Heap: Saviour of the Music Industry?" (The Guardian, 2015) <<https://www.theguardian.com/music/2015/sep/06/imogen-heap-saviour-of-music-industry>> accessed 8 August 2021

<sup>101</sup> R Murimi, "A Blockchain Enhanced Framework for Social Networking" [2019] 4 Proceedings of the First Symposium on Blockchain and Robotics, MIT Media Lab 1, 67

<sup>102</sup> L Lessig, "Code is Law: On Liberty in Cyberspace" [2000] (Harvard Law Magazine <<https://www.harvardmagazine.com/2000/01/code-is-law-html>> accessed 8 August 2021

<sup>103</sup> A Zwitter, J Hazenberg, "Cyberspace, Blockchain, Governance: How Technology Implies Normative Power and Regulation" in B Cappiello, G Carullo, "Blockchain, Law and Governance" (Springer 2021) 87-97

<sup>104</sup> J Goldenfein, A Leiter, "Legal Engineering on the Blockchain: 'Smart Contracts' as Legal Conduct" [2018] Law and Critique (Forthcoming) 4

protocols of the blockchain.<sup>105</sup> Whilst this is not an issue where the technology is being used to promote new innovation for the public good, problems arise when private interests utilise blockchain to reinforce the status quo or their own positions as intermediaries, thereby entrenching the existing problems that already undermine copyright.

Comparatively, in the area of DRM, there are clear examples of private interests using mechanisms to implement their own objectives, “sometimes resulting in the disregard of legal protections such as limitations and exceptions or even in the creation of a factual exclusivity over digital subject matter not eligible for copyright protection.”<sup>106</sup> One example would be rightsholders restricting e-books in the number of times they can be copied or printed, in spite of the original purchaser agreeing to delete their private copy, thus rendering transfer of copies subject to the physical reading device. Within the realm of blockchain, the Aragon Project exemplifies the system’s potential regulatory power. The project developers utilised an Ethereum platform which allowed users to setup decentralised autonomous organisations (DAOs).<sup>107</sup> A binding constitution has been embedded into the network and the rights and obligations it provides are encrypted onto smart- contracts.<sup>108</sup> If a similar blockchain is exploited to manipulate the normative behaviour of users, legislated copyright systems that recognise balancing copyright protection with human rights, freedom of expression, research, and innovation, could be subverted.<sup>109</sup>

Whilst there is generally no centralised body controlling a given blockchain, there are necessarily programmers who have the power to update, and at times recalibrate the blockchain to fix bugs, or conduct ‘forks’ to change or alter information.<sup>110</sup> Moreover, five large corporations control the majority of the mining process through their use of mining pools.<sup>111</sup> Therefore, blockchain, whilst certainly being decentralised at its core, is open to both the influence of its primary programmers, and, more broadly, through the corporate acquisition of its primary functional processes.

To prevent the abuse of the regulatory power of blockchain, in order that the technology does not merely entrench the current problems facing copyright in the digital market, contemporary

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<sup>105</sup> N Szabo, “Smart Contracts: Building Blocks for Digital Markets” [2018]

<sup>106</sup> M Finck, V Moscon, “Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0” [2019] I.I.C. 50, 77-83

<sup>107</sup> L Cuende, “The Aragon Manifesto” [2018] <<https://aragon.org/manifesto>> accessed 8 August 2021

<sup>108</sup> L Cuende, “The Aragon Manifesto” [2018] <<https://aragon.org/manifesto>> accessed 8 August 2021

<sup>109</sup> M Finck, V Moscon, “Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0” [2019] I.I.C. 50, 77-84

<sup>110</sup> A Papantoniou, “Smart Contracts in the New Era of Contract Law” [2020] 1 D.L.J. 4, 8-15

<sup>111</sup> *Ibid.*

legislative safeguards are needed to adapt the legal framework to guard against such misuse. One of the approaches to such a legislative solution would be the approach described by Niva Elkin-Koren in the form of user-rights.<sup>112</sup> Elkin-Koren highlights that users are not simply passive recipients of creative works, but represent another agent in the cycle of creativity.<sup>113</sup> In light of this, certain *ex-ante* rights should exist for users to allow continued access to pre-existing work, to take inspiration and enhance their skills, so that they may subsequently innovate.<sup>114</sup> Permitted usage, applied within a user-rights framework, would be embedded within the protocols of blockchain by law, ensuring that users are not subjected to overly-broad licences, or technological restrictions. Fair application of user-rights, combined with the benefits of blockchain, would ensure that the fundamental functionality of copyright is enhanced, as authors/creators will be able to receive just reward for their work via improved control of rights transfer and pricing, and users will have ensured access to the necessary materials to allow them to later become innovators. This user-rights approach, whilst not directly enshrined in current legislation, could be inferred from decisions of the CJEU. For example, in the CJEU's recent preliminary ruling in *Funke Medien NRW GmbH v Bundesrepublik Deutschland* the court explicitly state that copyright exceptions and limitations are to be considered not only interests, but rights, and that there is a finely balanced relationship between the right to intellectual property and freedom of expression.<sup>115</sup>

Of course, the embedding of permissible exceptions into a blockchain will present another problem, as the application of copyright exceptions is a nuanced task, subject to complex factors that computer code, especially code that has been embedded in a blockchain, may be too rigid to apply. Elkin-Koren argues that machine learning has advanced to such a point as to present a solution to this problem, however it remains uncertain as to whether available A.I. technology can detect or protect copyright exceptions to an acceptably accurate degree.<sup>116</sup>

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<sup>112</sup> N Elkin-Koren, "Copyright in a Digital Ecosystem: A User-Rights Approach" [2015] Forthcoming in R Okediji, Copyright in an Age of Limitations and Exceptions

<sup>113</sup> *Ibid.* 14

<sup>114</sup> *Ibid.*

<sup>115</sup> Case C-469/17 *Funke Medien NRW GmbH v Bundesrepublik Deutschland* ECLI:EU:C:2019:623, 60-62, S Schwemer J Schovsbo, "What is Left of User Rights? – Algorithmic Copyright Enforcement and Free Speech in the Light of the Article 17 Regime" P Torremans, *Intellectual Property Law and Human Rights* (4th ed, Wolters Kluwer, 2020) 9

<sup>116</sup> N Elkin-Koren, "Fair Use by Design" [2017] 64 U.L.R. 22, 1082-1100, P Yu, "Can Algorithms Promote Fair Use?" [2020] 14 F.L.R., 329-331

### 3.6. Chapter Summary Analysis

One of the main issues that undermine copyright, presented by OSPs, is that by attempting to maximise profit from a given user, OSPs attempt to exert as much commercial control over user content as possible, whilst simultaneously attempting to keep users in the dark. As a result of this, users must deal with overly broad licences, and a lack of revenue or usage data, essentially being left with very little bargaining power, or means to increase their bargaining power through accurate data. This undermines the functionality of copyright, as if innovators or potential innovators cannot wield their rights with confidence, or accurately bargain with intermediaries for fair, efficient remuneration, then the incentive to take risks or create will decrease. Blockchain can empower innovators by first, providing a decentralised transparent framework that requires consensus to change fundamental structures such as the terms of service. Second, by facilitating a secure and efficient environment for the use of smart- contracts, which enable users to directly transfer rights whilst wielding greater control over their copyright through precision revenue and usage data.

Blockchain could theoretically remove the need for OSPs or other intermediaries altogether, by re-calibrating the balance of power in favour of the user/innovator, and galvanising copyright by placing its fate back in the hands of the rightsholder; whilst simultaneously decreasing transaction costs and increasing the likelihood of innovation with the broadening of secondary markets such as re-use.

Furthermore, the lattice of immutable data that blockchain creates provides the opportunity to create an effective repository of RMI, which will enable a more efficient and fluid sharing of accurate data relating to copyright related issues such as ownership. Current databases controlled or utilised by OSPs and other intermediaries undermine copyright by the retention of asymmetrical data-sets and imbed barriers to effective data-sharing as there is little incentive for competitors to trust each other. Inefficient access to RMI undermines copyright through the promotion of inaccurate claims, over-licensing, over-enforcement, and reduction in the ability of rightsholders to attain or distribute revenue effectively. Blockchain removes the need for trust and allows highly tamper-resistant information to be integrated onto the chain.

In this manner, a blockchain system can improve on OSP solutions to such as ContentID, as blockchain provides a system that benefits from immutability and consensus change. OSP solutions to issues of ownership evolve to ensure that liability exemptions are applied, and consequently the parameters of such solutions are subject to unilateral change according to a given platform's desire to limit liability exposure. This means that OSPs will undermine

copyright by employing mechanisms which err on the side of caution, and against the creator. A blockchain-based repository would enhance copyright by ensuring that not only is there a reliable central database of RMI, that can be utilised for robust evidentiary purposes, but also offer a solution that will not change capriciously at the expense of user copyright control. This will ensure market and creativity longevity by raising the levels of trust that creators have in utilising copyright, creating new, legitimate derivative works and improving the efficiency by which rights and information are traded.

Whilst blockchain can enhance copyright in the form of transparent repositories of RMI that do not require trust amongst data-sharing parties, the immutable nature of the blockchain that makes up the backbone of such repositories can attain a copyright undermining character. Following the 'garbage in, garbage out' theory of code, blockchain-based systems can become vulnerable to the input of inaccurate data. Whether this is input maliciously or innocently, inaccurate data integrated onto the blockchain could end up creating a quagmire of uncertainty for users and OSPs alike, as the system will facilitate the creation of immutable liability and problematic takedown requests. This issue is aggravated due to the decentralised nature of a blockchain, in that there is no central governing body that can process takedown requests, or easily amend integrated data. One suggested solution to this issue has been to utilise A.I. and advanced algorithms to limit the amount of inaccurate data being added to the blockchain. This would introduce added transaction costs; however, this could potentially be offset by overall lower transaction costs resulting from other efficiencies introduced by blockchain technology, such as direct transfer of rights and improved revenue control.

However, even with the bolstering of A.I. and algorithmic advancements, blockchains efficacy can largely depend on active users; as a decentralised system, how secure a blockchain remains depends on maximising the number of available networks that are utilised, as the more networks available, the higher the computational power needed to overcome such a system. Nevertheless, the number of blockchain-literate users available to maximise the potential of blockchain is still significantly low, and this is highlighted against the vast numbers of users comfortable with the format of navigating, uploading and operating OSPs. If current OSPs view blockchain-based systems as threats to their control over creative content and reject blockchain technology in favour of proprietary alternative solutions, then the utility or relevance of blockchain in strengthening copyright would be severely diminished.

On the other hand, OSPs could choose to embrace blockchain technology, and utilise their millions of users, alongside near universal communication capabilities, to maximise

the potential of blockchain and subsequently benefit from the improvements to RMI data-transfer and fluid, accurate, trading of rights. However, the influence of OSPs and other intermediaries upon blockchain-based system could come with a risk of abuse. As emphasised by OSPs' terms of service, they are interested in exerting as much commercial control over user copyright as possible, to maximise profit. This interest will not wane with blockchain technology. Blockchain-based systems may be in theory decentralised, but they have massive regulatory potential. A combination of self-executing protocols lays the foundation for blockchain to become a powerful tool for manipulating the normative behavior of users. If external parties can utilise blockchain to manipulate the normative behaviour of creators and users, then blockchain technology, rather than creating new systems of enhanced copyright management, will merely serve to reinforce the systems that are already in place, whilst simultaneously subverting legislated public policy that would otherwise enhance user rights.

#### **Chapter 4 – Conclusion**

Online service providers present numerous problems to copyright and the wielders of copyright. Through the manipulation of normative behaviour, and the quest for commercial control, users are subject to uncertainty and a lack of control over their content. OSPs therefore facilitate the maintenance of a *status quo* that is inherently imbalanced, with those that copyright seeks to protect generally lacking meaningful bargaining power, and large intermediaries subsequently retaining a lion's share of available revenue. This imbalance is demonstrable in the lack of push back against frequently inaccurate takedown notices, with users unsure, or afraid to initiate appeals. It is by propagating this milieu of uncertainty and imbalanced power that OSPs undermine copyright.

After analysing these undermining aspects of OSPs, to what extent can blockchain technology help or hinder copyright? Blockchain has considerable potential to reinforce copyright with regard to problems posed by OSPs. Immutable data, consensus-based decision-making, accountability and transparency, coupled with smart-contracts, equip blockchain technology with the potential to re-calibrate the imbalance of power between users and intermediaries. In doing so, freeing users from normative behavioural manipulation and capricious terms of service. By establishing a global repository of rights, blockchain could create the first effective database of RMI, thereby reducing transaction costs and confusion relating to copyright ownership; increasing efficiency in the trading of rights for users and intermediaries alike.

However, blockchain technology has several problems, which if left unresolved could result in the reinforcement of the *status quo*, rather than the bolstering of copyright. The 'garbage in, garbage out' problem is a significant issue for blockchain technology. Combined with the regulatory potential of blockchain, a blockchain could become a quagmire of inaccurate or malicious data, compounding problems for users relating to ownership information and liability. Persistent private parties could automatically enforce control over content and subvert public policies that otherwise enshrine the balancing of freedom of expression, access to knowledge and the pursuit of creativity.

Meanwhile, the potential of blockchain relies on a robust network of users, and without this, will be vulnerable to attack. The network issue, and how it deals with blockchain potential, is ultimately indicative of why blockchain does not offer any substantial solutions to the problems currently posed by OSPs. Blockchain has a lot of potential, it could theoretically shift the balance of power, and benefit copyright and users immensely. Nevertheless, there are too many aspects of blockchain technology that remain in flux, regulation is needed to prevent abuse of blockchain regulatory power, blockchain-literate users are required to maximise efficiency, A.I. is required to prevent the 'garbage in, garbage out' issue. Therefore, in its current form, blockchain cannot substantially assist in answering the questions posed by OSPs in the matter of copyright.

Finally, whilst analysis shows that OSPs do undermine copyright, do OSPs undermine copyright to a critical degree? By democratising the process of content production and dissemination, OSPs continue to facilitate the creation of more creative content than we have ever seen. Alongside this, OSPs have developed systems of analysis that have resulted in increased certainty of success, and robust protection of copyright. This has reinforced the functionality of copyright by decreasing the risk of failure for innovators, targeting instances of straight piracy, and allowing room for UGC to flourish. It is within this context that OSPs have encouraged the enhancement of both primary and secondary markets for content. Therefore overall, whilst posing several significant problems to copyright, OSPs succeed in substantially encouraging the production, and making available of new creative content, whilst providing essential revenue opportunities through the expansion of both primary and secondary markets.

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