

RESEARCH ARTICLE

The evolution and consequences of digital rights management in relation to online music streaming

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Abstract

Streaming services now provide the dominant way in which music is distributed and consumed online. Digital rights management (DRM) lies at the heart of this trend and has evolved alongside a movement from copy-based to streaming-based consumption. This shift poses a number of new and unique issues. Music streaming services have changed the nature of the product offered, with musical content becoming de-bundled and reduced to a series of permissions covered by DRM and associated licences, leaving users trapped in a permission-based system. This may create tension with copyright law principles regarding personal ownership and exhaustion of rights in relation to secondary markets, but through analysing relevant US and European case law it can be demonstrated that there is little, if any, legal opportunity for digital secondary markets to emerge. There are also further specific consequences which may affect artists relating to musical diversity and the composition of popular music and, also, consequences regarding the changing nature of the Internet itself. In this context copyright remains centrally important, but only in establishing the initial proprietary rights that enable subsequent DRM and licence-based online exploitation, indicative of a re-establishment of record industry power that is now allied to streaming platforms.

Keywords: intellectual property; copyright; digital rights management; streaming; music

Introduction

Since 2016, revenues from music streaming services have surpassed those from physical sales and continue to grow, suggesting that this can now be regarded as the dominant form of music distribution. Digital rights management (DRM) systems lie at the heart of this trend and are crucial in this context, enabling such business models in the first place and subsequently protecting the content offered on such platforms. Whilst seemingly beneficial in terms of revenue and consumer welfare, this shift poses a number of important issues which this research will address. Music streaming services have changed the nature of the product offered. Musical content is becoming de-bundled and reduced to a series of permissions covered by DRM and associated licences which may leave users trapped in a permission-based system, and which will be explored by analysing the content of end user licence agreements (EULAs) offered by the large streaming providers. This may also have consequences for the application of copyright law itself regarding personal ownership and exhaustion issues. The doctrine of exhaustion provides a limitation on the economic right of distribution and prevents copyright owners from controlling the subsequent distribution of a work once it has already been 'sold' in the market. This enables secondary markets to develop and operate for copyrighted content, but a combination of restrictive EULAs and DRM measures may negate the ability of such digital secondary markets to form.

Although streaming marks a fundamental change from traditional copy-based distribution mechanisms, relevant case law from the US and Europe demonstrates that it is not necessarily the case that digital markets already accommodate this principle. Nonetheless, these licences raise a

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number of significant issues in their own right for consumers and artists; they create costs in reading and understanding, are non-negotiable and arguably indistinguishable such that consumers' ability to draw comparison and make informed decisions is undermined. They are more representative of the asymmetric power dynamic between rights holders and consumers, and redefine consumers' relationship with content by limiting the transfer of the 'product' to a series of permissions. This may have a number of further consequences which will be investigated. It is arguably more difficult for new artists to break into the charts, potentially damaging diversity, and recent research has also suggested that popular music composition is changing, which may be creating new compositional norms artists have to conform to for commercial success. On a more technical level, but equally as important, the very nature of the Internet may be changing. The growth of DRM-supported streaming platforms highlights the importance of networks for content delivery. Whilst originally envisaged as a network free of technical control based on the end-to-end principle of system design, the Internet threatens to fragment, with latent DRM control operating on and across the network and connected devices.

The success seemingly enjoyed by music streaming providers suggests that these do not seem to be of much (if any) concern to the users of such services, who appear to value the ease and convenience such services provide in comparison with content on physical media. Inevitably though, this trend is likely to continue and whilst copyright also remains centrally important, its focus is no longer on enforcing reproduction rights, as the 'copy' has been removed from the equation. Instead, the role of copyright in this context is merely founding the initial proprietary rights that enable subsequent DRM and licence-based online exploitation – going back to the future to re-establish record industry power allied now to streaming platforms.

This piece will focus on US and EU jurisdictions as both have developed legal frameworks regulating DRM. Whilst music is the primary focus, reference will be made to other copyright works for comparison where necessary. It will begin with an overview of DRM and its evolving nature in the context of music streaming; in particular, its history and early legal controversies can be seen with reference to the US. It will then explore the issue of secondary markets, tied to an analysis of both EULAs and comparable case law from the US and also Europe regarding the principle of copyright exhaustion. Both the US Copyright Act (which refers to the principle as the first sale doctrine) and European Directives place specific restrictions on the rights of copyright owners when it comes to distribution. Finally, issues relating to the diversity and composition of popular music and the architecture of the Internet itself will be explored.

1. Digital rights management

DRM is nothing new when it comes to copyright protection and is certainly not synonymous with music. It has arguably been around in some way since the 1970s, originating in the area of software. With the advent of microcomputers towards the end of that decade, bespoke hardware and software packages became de-bundled, with software providers creating standalone products that did not require additional technical support.¹ Early technical means here involved utilising a machine's 'uniqueness' (based on its serial number) and installation protocols to prevent unauthorised use of software.²

In the US, early reference was made to it in the Sony Betamax case³ where the Supreme Court referred to 'scrambling' broadcast signals in order to 'jam' the recording of television programmes⁴ which could be seen as an early DRM solution (although not 'digital' as such). Further efforts persisted in relation to subsequent video cassette recorder technology with then analogue devices employing techniques to interfere with recording synchronisation and subsequently video scrambling.⁵ In the audio industry, the advent of

¹R Anderson *Security Engineering* (Hoboken: Wiley, 2nd edn, 2008) p 682.

²Ibid, pp 682–683.

³*Sony Corp of America v Universal City Studios*, 464 US 417 (1984).

⁴Ibid, at 495.

⁵Anderson, above n 1, p 691.

the Digital Audio Tape in the late 1980s caused concern, as it enabled perfect and non-degradable reproduction. This resulted in the introduction of a serial copy management system. In the early 1990s, this gained legal recognition, with the US Audio Home Recording Act of 1992,⁶ providing for a serial copy management system in all digital audio recording devices to prohibit multiple copies being made.

It was only with the development of the Internet and associated digital technologies that it was felt further protection was warranted in order to enhance the effective exercise of copyright in the digital environment. The first attempt to conclude an international agreement in response to the perceived challenges of digital technology was made by the World Intellectual Property Organisation (WIPO) and led to the adoption of two treaties, which established a common basis for DRM protection: the WIPO Copyright Treaty (WCT)⁷ and the WIPO Performances and Phonograms Treaty (WPPT).⁸ The Treaties established, for the first time, that technological protection measures (TPMs) used by rightsholders to protect their works enjoy an independent protection, as well as providing protection for rights management information (RMI) that identifies the work and related copyright information. In the United States, equivalent measures were introduced in s 1201 of the Digital Millennium Copyright Act in 1998;⁹ and in Europe, under Article 6 of the Information Society Directive¹⁰ (InfoSoc Directive). Both pieces of legislation provide protection for the technological measures themselves as well as a prohibition on the manufacture, import and distribution of any device that is primarily intended to facilitate the circumvention of such measures.

Indeed, when the idea that ‘the answer to the machine is in the machine’ was proposed in 1995¹¹ by Charles Clark, legal adviser to the International Publishers Copyright Council, it is questionable whether such protections were envisaged. Instead, the goal was that technology would not so much control content but would manage and identify the content being used and the users using it. The threats posed by digital technologies and the perceived lack of copyright’s enforceability in the online world explain why rightsholders turned to such private ordering measures as a form of ‘front-end’ protection. DRM was, therefore, a sign that the content industries were becoming adept at presenting the digital environment as a threat.¹² The extension of copyright protection to include such systems along with anti-circumvention provisions is indicative of Clarke’s metaphor being taken as a call to action to utilise copyright in order to regulate the machine.¹³

DRM is a generic term referring to different restrictive measures employed by rightsholders to restrict unauthorised use, or copying, of content.¹⁴ It involves the use of technology to control digital content, and although the specific components vary from system to system, they can be distilled down to a set of trusted rules, attached to a digital file, that make the use of digital content dependent upon authorisation and have the advantage of being self-executing or independently enforcing.¹⁵ It will mainly come into play at the last stage of the value chain before delivery to the user.¹⁶ DRM technologies concern the management of certain ‘permissions’ and may more aptly be described as ‘code

⁶US Audio Home Recording Act, 106 Stat 4237 (1992), to amend title 17, United States Code, to implement a royalty payment system and a serial copy management system for digital audio recording, to prohibit certain copyright infringement actions, and for other purposes.

⁷WIPO Copyright Treaty (WCT), adopted in Geneva on 20 December 1996.

⁸WIPO Performances and Phonograms Treaty (WPPT), adopted in Geneva on 20 December 1996.

⁹Digital Millennium Copyright Act, 112 Stat 2860 (1998), to amend title 17, United States Code, to implement the World Intellectual Property Organization Copyright Treaty and Performances and Phonograms Treaty, and for other purposes.

¹⁰Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

¹¹P Goldstein *Copyright’s Highway: From Gutenberg to the Celestial Jukebox, Revised Edition* (Stanford: Stanford University Press, 2003) pp 165–170.

¹²D Hesmondhalgh *The Cultural Industries* (London: SAGE Publications, 2nd edn, 2007) p 151.

¹³W Patry *How to Fox Copyright* (Oxford: Oxford University Press, 2011) p 233.

¹⁴See for example CJ Angelopoulos ‘Modern intellectual property legislation: warm for reform’ (2008) 19(2) *Entertainment Law Review* 35 at 36 and S Bechtold ‘Digital rights management in the United States and Europe’ (2004) 52 *American Journal of Comparative Law* 323 at 331.

¹⁵B Kemp ‘Copyright’s digital reformulation’ (2002–2003) 5 *Yale Journal of Law & Technology* 141 at 144.

¹⁶F Koempel ‘Digital rights management’ (2005) 11(8) *Computer and Telecommunications Law Review* 239 at 239.

as code' through their use by rightsholders to restrict user rights.¹⁷ Their primary purpose is that of control, mapping the physical property restrictions into the digital world. With their technical and legal elements, they may be described in the following way:

DRM is technical code, backed up by legal code, for the purposes of identifying, distributing and protecting digital content and that works by acting as a constraint against unauthorised uses of such content.¹⁸

However, in the era of music streaming, RMI is also integral to DRM systems; in particular as it operates to identify the work, its author or copyright owner, or related information about the terms and conditions of use of the work. As a result, references to DRM in the context of music streaming necessarily include RMI.

In 2001, the first DRM-protected CD was realised in the UK: 'White Lilies Island' by Natalie Imbruglia on RCA label, which is a subsidiary of Sony Music. This used a third party technology to prevent the CD from being played or copied on a PC CD-ROM drive. Further incidents involving Sony Music emerged in the following years where again DRM copy-prevention measures were implemented on audio CDs that were much more invasive; creating security holes and leaving PCs unstable to run.¹⁹ Such examples are indicative of the pre-existing operation of DRM where it was bundled with, or 'attached' to, the content it was designed to protect.

The film industry utilised similar measures. In the 1990s, DVD releases were encrypted with the Content Scramble System (CSS) in order to prevent the content being copied, played on unauthorised devices and/or in unauthorised regions, but had been circumvented in 1999 in the form of DeCSS.²⁰ This gave rise to a series of DRM-focused lawsuits in the US against individuals for making DeCSS publicly available,²¹ and technology providers for products enabling a DVD to be copied onto a computer hard drive.²²

However, the operation of DRM has evolved as new means of distribution and consumption have emerged. This is evidenced by more recent controversies, notably involving Amazon's remote deletion of George Orwell's *1984* from Kindle e-readers in 2009,²³ which suggests DRM measures are no longer immediately intertwined with physical media as a consequence of content consumption moving to streaming and on-demand-based networks. In particular, streaming has become the dominant means by which music content is being consumed. In this context, DRM and associated RMI thereunder is important as an enabler of these new business models.

2. Streaming

Music arguably lends itself very well to a streaming-based models as it is generally consumed by repeated listening²⁴ and in 2016 revenues from music streaming services surpassed those from physical

¹⁷P Samuelson 'Digital rights management {and, or, vs.} the law' (2003) 46(4) Communications of the ACM 41 at 42. See also L Lessig *Code Version 2.0* (New York: Basic Books, 2006) p 116.

¹⁸N Scharf 'Digital rights management and fair use' (2010) 1(2) European Journal of Law and Technology.

¹⁹S Knopper *Appetite for Self-Destruction: The Spectacular Crash of the Record Industry in the Digital Age* (London: Simon & Schuster, 2009) pp 222–228.

²⁰See <http://www.cs.cmu.edu/~dst/DeCSS/FrankStevenson/mail1.txt>.

²¹*Universal v Reimerdes*, 11 F Supp 2d 294 111 and *DVD Copy Control Association Inc v Bunner*, 116 Cal App 4th 241.

²²*RealNetworks Inc v DVD Copy Control Association Inc*, 641 F Supp 2d 913 and *321 Studios v Metro Goldwyn Mayer Studios Inc*, 307 F Supp 2d 1085 (2004).

²³B Johnson 'Amazon Kindle users surprised by "big brother" move' (*The Guardian*, 17 July 2009), available at <http://www.guardian.co.uk/technology/2009/jul/17/amazon-kindle-1984>. See also 'Ofcom knocks back BBC DRM plans' (*BBC News*, 10 November 2009), available at <http://news.bbc.co.uk/1/hi/technology/8352241.stm>, and C Arthur 'Microsoft cutting off up to 1m gamers with modified Xbox 360 controls' (*The Guardian*, 11 November 2009), available at <http://www.guardian.co.uk/technology/2009/nov/11/xbox-modded-consoles-live-cut-microsoft>.

²⁴M Scherzinger 'Toward a history of digital music: new technologies, business practices and intellectual property regimes' in N Cook et al (eds) *The Cambridge Companion to Music in Digital Culture* (Cambridge: Cambridge University Press, 2019) p 49.

sales for the first time.²⁵ This trend continued in 2017 and 2018 with the International Federation of Phonographic Industries stating that streaming revenues grew 34% in 2018 alone.²⁶ As such, it is clear that streaming is the dominant form of music distribution and revenue generation online, compared to physical format sales which declined by 10.1% in the same year.²⁷ Platforms such as Spotify have contributed to ‘distracting’ users from downloading content, familiarising them with on-demand streaming²⁸ which has now become a major standard in the online distribution of digital works, allowing the user to consume the content in ‘real time’.²⁹ As such, this suggests that the normative conduct of users is also being channelled into specific distribution and consumption channels which the music industry has been searching for since the Napster era in the early 2000s when it became clear that: ‘Better business models are the Holy Grail of the digital age’.³⁰ Certainly, there is evidence that a degree of vertical integration between record labels and intermediaries has taken place, with the major record labels acquiring equity stakes in Spotify upon its inception.³¹ This is also representative of the music industry acting to mitigate risk and seemingly promotes consumer welfare alongside technological developments.

In this respect, improvements in storage, Internet connectivity and speed, as well as consumer preferences, have helped familiarise consumers with on-demand content:

The kids’ culture is a highly mobile, networked, all-digital, and interactive culture, and digital technologies are a tacit standard that is completely and unobtrusively integrated into their lifestyles.³²

This is the so-called ‘Net generation’.³³ Indeed, recent statistics published in 2019 reveal that the highest proportion of music streamers are those in the 16–24 age group, where 68% of users stream, compared to 52% who download and 20% who purchase physical copies. This is compared to 61% and 45% who stream music in the 25–34 and 35–44 age categories respectively.³⁴ Even in 2016, the reach of streamed music among the Net-generation of 16–24 year olds was effectively double that of 25–34 and 35–44 year olds.³⁵ The roll-out for 4 G in 2013 further enabled this with 47% of 4 G users found to have engaged in streaming or downloading music/audio, compared to 28% without 4 G connectivity in 2015.³⁶

²⁵International Federation of Phonographic Industries *Global Music Report 2017: Annual State of the Industry* (2017) p 10, available at <https://web.archive.org/web/20190918044926/https://www.ifpi.org/downloads/GMR2017.pdf>.

²⁶International Federation of Phonographic Industries *Global Music Report 2019: Annual State of the Industry* (2019) p 6 available at <https://web.archive.org/web/20190529065926/https://www.ifpi.org/downloads/GMR2019.pdf>.

²⁷Ibid, p 15.

²⁸M Borghi ‘Chasing copyright infringement in the streaming landscape’ (2011) 42(3) *International Review of Intellectual Property and Competition Law* 316 at 317.

²⁹Ibid, at 317.

³⁰LS Sobel ‘DRM as an enabler of business models: ISPs as digital retailers’ (2003) 16 *Berkeley Technology Law Journal* 667 at 667.

³¹T Ingham ‘Here’s exactly how many shares the major labels and Merlin bought in Spotify – and what those stakes are worth now’ (*Music Business Worldwide*, 14 May 2018), available at <https://www.musicbusinessworldwide.com/heres-exactly-how-many-shares-the-major-labels-and-merlin-bought-in-spotify-and-what-we-think-those-stakes-are-worth-now/>.

³²D Kusek and G Leonhard *The Future of Music: Manifesto for the Digital Music Revolution* (Boston: Berkeley Press, 2005) p 102.

³³Ibid, p 99.

³⁴Intellectual Property Office *Online Copyright Infringement Tracker: Latest Wave of Research (March 2019) Overview and key findings*, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/867708/oci-tracker-2020.pdf.

³⁵Ofcom ‘Communications Market Report 2016’ (4 August 2016) pp 114–115, available at https://www.ofcom.org.uk/_data/assets/pdf_file/0024/26826/cmr_uk_2016.pdf.

³⁶Ofcom ‘Communications Market Report 2015’ (6 August 2015) p 82, available at https://www.ofcom.org.uk/_data/assets/pdf_file/0022/20668/cmr_uk_2015.pdf.

Streaming operates by utilising technology in a way that does not permit downloading.³⁷ In this scenario, content is stored on a central server from where a transmission is initiated at the request of a user.³⁸ Content streaming has the advantages of efficiency (through compression), leaving no trace of the compressed content (unless permitted by the rightsholder) and the ability of control (to access streamed content, the user will have to return to the rightsholder's service).³⁹ Once the process of streaming has started, it is a continuous process of transmission,⁴⁰ but which nonetheless involves a degree of copying or buffering (whereby a certain amount of data is downloaded as an advance supply⁴¹) to facilitate the smooth receipt and playing of the user's chosen content. Although this is essentially an act of temporary storage, it is not an act of 'reproduction' in legal terms; nowhere is a 'copy' of the content stored or any part of it retrievable by users.⁴²

As a result, streaming marks an important change from the traditional copy-based distribution mechanisms that have previously existed, and which were undermined through digital technologies and unauthorised downloading in the early 2000s. In the streaming context, a manageable DRM system requires elements such as: rights to manage; encryption; licence management; and a DRM-capable player.⁴³ When a customer plays the content, a licence request is sent to the copyright owner's proxy, which communicates with an authentication process to validate the user's rights to the content and release the necessary encryption.⁴⁴ Here, RMI operates in order to enable the content to be played and to track or record information about the content being played independently of the content itself. Clearly, compared to its previous iterations, DRM in this context has very little to do with controlling 'serial copies', but rather managing the delivery of musical content and being utilised to design (online) conduits for its consumption.⁴⁵

The operation of DRM on streaming services has an important adjunct through the associated licences that such services offer in order to use their particular service. Arguably, a modern and pragmatic copyright regime needs to regulate access,⁴⁶ and through the operation of DRM in this respect, the ability of content owners to offer and regulate the distribution and consumption of their works may lead to a greater number of specialised options and a wider range of consumer choices.⁴⁷ However, any potential benefits in this respect have, arguably, been negated by homogenised licence terms.

3. Licences

In theory, DRM allows the market to be encapsulated as one single entity⁴⁸ so as to be able to tailor more closely availability and demand⁴⁹ (therefore mitigating risk and improving consumer choice and welfare). DRM provides the ability to design different services and offers producers the ability to price discriminate with regard to buyer tastes and, potentially, enable greater revenue recovery.⁵⁰ With DRM,

³⁷S Stokes *Digital Copyright: Law and Practice* (Oxford: Hart Publishing, 3rd edn, 2009) p 157.

³⁸Borghi, above n 28, at 319.

³⁹Stokes, above n 37, p 157.

⁴⁰Borghi, above n 28, at 327.

⁴¹See website available at <https://www.pcmag.com/encyclopedia/term/buffering>.

⁴²Borghi, above n 28, at 328.

⁴³J Ozer 'DRM' (2017) 14(2) *Streaming* 122 at 122–123.

⁴⁴*Ibid*, at 125.

⁴⁵Scherzinger, above n 24, p 52.

⁴⁶N Lucchi 'The supremacy of techno-governance: privatization of digital content and consumer protection in the globalized information society' (2007) 15(2) *International Journal of Law and Information Technology* 192 at 211.

⁴⁷MA Einhorn and B Rosenblatt 'Peer-to-peer networking and digital rights management – how market tools can solve copyright problems' (2005) 534 *Cato Institute Policy* 3.

⁴⁸JGH Griffin 'The changing nature of authorship: why copyright law must focus on the increased role of technology' (2005) 2 *Intellectual Property Quarterly* 135 at 145.

⁴⁹P Ganley 'Digital copyright and the new creative dynamics' (2004) 12(3) *International Journal of Law and Information Technology* 282 at 289.

⁵⁰Einhorn and Rosenblatt, above n 47, at 3.

the rightsholder may make a range of choices that directly affect the availability of their content,⁵¹ and any privileges rightsholders adopt should in theory compete with one another in the marketplace (such that the market will no longer be for content, but the 'best' form of DRM content). A new use 'equilibrium' would, therefore, assert itself through a process of experimentation,⁵² and presumably competition. However, this has not proved to be the case as the main streaming content providers appear to have largely homogenised licensing terms which are accompanied by DRM measures.

This can be evidenced by more closely looking at the EULAs or terms and conditions of service provided by several of the biggest streaming and high-profile services: Spotify, Deezer, Pandora, Tidal, Amazon and Apple (through iTunes and Apple Music). These have been chosen for analysis owing to the fact that Amazon and Deezer are amongst the most popular music streaming services used in the UK, according to market research published by the UK Intellectual Property Office⁵³ (although YouTube and Google Play Music also feature here, they have not been included in the sample due to their more recent integration to YouTube Music which supersedes Google's own service⁵⁴). Similarly, Pandora is amongst the leading streaming services in the US (after Apple and Spotify) with 36.8 million users as of March 2018.⁵⁵ Jay-Z's Tidal service will also be included as an example of an artist-led initiative. Whilst it has a much smaller presence in the market, it has been included for comparison owing to its famous backer (Jay-Z) and its high-profile launch in 2015 along with artist stakeholders. Unlike Spotify, it does not offer a 'freemium' option and differentiates its service on creating a better service for fans and artists,⁵⁶ along with tiered pricing based on audio quality.⁵⁷ Therefore, it is worth considering whether any distinction can be seen in the content of its EULA.

The licence terms of these services are suggestive of the practices of rightsholders to deny copy ownership;⁵⁸ all except Deezer refer to the granting of a non-exclusive and/or non-transferable licence to the consumer to make use of the services. In particular, Apple states that 'Apps made available through the App Store are licenced, not sold to you'. And: '... the terms of this standard EULA will govern any content, materials, or services accessible from or purchased within the Licensed Application'.⁵⁹ Similarly, Pandora grants a limited, non-transferable and revocable licence to access its services through 'certified applications or intended methods'.⁶⁰ Spotify also states that:

Spotify and its licensors retain ownership of all copies of the Spotify software applications and Content even after installation on your personal computers, mobile handsets, tablets, and/or other relevant devices.⁶¹

Spotify, Deezer, Tidal and Amazon refer specifically to DRM and/or TPM measures regarding content available through their services and whilst Apple provides for DRM-free content, this is only allowed

⁵¹M Grynberg 'Property is a two-way street: personal copyright use and implied authorization' (2010) 79 *Fordham Law Review* 435 at 481.

⁵²G Parchomovsky and PJ Weiser 'Beyond fair use' (2010) 96 *Cornell Law Review* 91 at 127.

⁵³Intellectual Property Office, above n 34, pp 29–30.

⁵⁴L Snapes and M Sweney 'YouTube to launch new music streaming service' (*The Guardian*, 17 May 2018), available at <https://www.theguardian.com/music/2018/may/17/youtube-music-new-streaming-service-launch>.

⁵⁵A Watson 'Most popular music streaming services in the US 2018–2019, by audience' *Verito Statista Report* (11 March 2020), available at <https://www.statista.com/statistics/798125/most-popular-us-music-streaming-services-ranked-by-audience/>.

⁵⁶R Iyengar 'Jay Z just launched his own music-streaming service called Tidal' (*Time*, 30 March 2015), available at <https://time.com/3764675/tidal-for-all-jay-z-streaming-music-spotify/>.

⁵⁷A Flanagan and A Hampp 'It's official: Jay Z's historic tidal launches with 16 artist stakeholders' (*Billboard*, 30 March 2015), available at <https://www.billboard.com/articles/news/6509498/jay-z-tidal-launch-artist-stakeholders>.

⁵⁸A Perzanowski and J Schultz 'Reconciling intellectual and personal property' (2015) 90 *Notre Dame Law Review* 1213 at 1237.

⁵⁹'Licensed Application End User Licence Agreement', available at <https://www.apple.com/legal/macapps/stdeula/>.

⁶⁰Pandora Terms of Use', available at <https://www.pandora.com/legal>.

⁶¹Spotify Terms and Conditions of Use', available at <https://www.spotify.com/uk/legal/end-user-agreement/>.

on a ‘reasonable number of compatible devices that you own or control’.⁶² DRM-free content also has further restrictions which, although allowing use on any number of synched devices, is only permitted on a maximum of five computers.⁶³ Deezer states that its free service is only available on one connection at a time and that it has the technical means to detect any attempts at multiple connections.⁶⁴ Deezer and Pandora users are also expressly bound not to circumvent the services’ technical protection measures or systems,⁶⁵ as is also the case with Tidal.⁶⁶

Where premium/subscription services enabling downloading are available, restrictions are still evident. Deezer refers to ‘temporary downloading’,⁶⁷ and Tidal to ‘temporary storage’.⁶⁸ Amazon states that, ‘When you purchase Music Content from the Store, you are directing us to store that Purchased Music for you’ and that ‘You expressly grant or transfer to us all permissions and benefits necessary to provide you cloud-based access to your Music Content’.⁶⁹ Deezer and Tidal state, in addition, that content cannot be transferred to any other medium.⁷⁰ Where premium or subscription services are offered on Spotify, Deezer, Tidal and Amazon, access to such content ceases upon the subscription ending or not being renewed.⁷¹

These licences create a number of issues in their own right:⁷² they create costs in reading and understanding, are non-negotiable and arguably indistinguishable, such that consumers’ ability to draw comparison and make informed decisions are undermined. Instead of representing a bargaining process between producers and users, they are more representative of the asymmetric power-dynamic between producers and users and redefine users’ relationship with content by limiting the transfer of the ‘product’ to a series of permissions. This may have a number of consequences that will now be explored.

4. Consequences

Most obviously, music streaming services have changed the nature of the product that is being offered. Musical content has been de-bundled, from a copy with various rights therein, to a series of permissions (covered by DRM and the licences). This has consequences for the application for copyright law itself regarding ownership and exhaustion issues: ‘The copyright marketplace is rife with examples of rightsholders and their intermediaries insisting that consumers do not actually own the copies they buy’.⁷³ This has implications for secondary markets for copyright content and whilst these may be limited in their actual effect, there is also a suggestion that the charts are becoming less diverse,⁷⁴ as well as the fact that the composition of popular music itself may be changing. Beyond this, it can be argued that the nature and use of DRM technologies in enabling these business models can impact the design principles evident in the development and operation of the Internet. These will now be explored in turn.

⁶²Apple Media Services Terms and Conditions’, available at <https://www.apple.com/legal/internet-services/itunes/us/terms.html>.

⁶³Ibid.

⁶⁴Deezer Terms of Use’, available at <https://www.deezer.com/legal/cgu>.

⁶⁵Ibid and above, n 60.

⁶⁶TIDAL – Terms & Conditions of Use’, available at <https://tidal.com/terms>.

⁶⁷Above, n 64.

⁶⁸Above, n 66.

⁶⁹Amazon Music terms of Use’, available at <https://www.amazon.co.uk/gp/help/customer/display.html?nodeId=201380010>.

⁷⁰Above, nn 64 and 66.

⁷¹Above, nn 61, 64, 66 and 69.

⁷²See A Perzanowski and J Schultz *The End of Ownership: Personal Property in the Digital Economy* (Cambridge: MIT Press, 2016).

⁷³Perzanowski and Schultz, above n 58, at 1235.

⁷⁴S Sjölander *Did Modern Media Skill the Superstar? A contribution to the theory of consumer behaviour in the presence of increasing information* (Lund University, 2016), available at <https://lup.lub.lu.se/student-papers/search/publication/8880948>, pp 21–22. See also J Earls ‘There will be no new entries in the Top 40 singles chart this week’ (*NME*, 4 July 2016), available at <https://www.nme.com/news/music/various-artists-170-1192642>.

(a) Ownership and secondary markets

The success of the music industry has traditionally depended on the sale of copies and on user participation through the market; their ownership of copies therefore provides a reason for them to do this.⁷⁵ However, this is changing as a result of the growth of streaming services which has put increased tension on this relationship, as the tangible copy is no longer the dominant force in the digital music market.⁷⁶

...the physical copy is, and has historically been, the basic unit of consumption of a work, and the unauthorized creation of additional units of consumption undermines the copyright grant.⁷⁷

The growth of streaming distribution removes the 'copy' from the equation and it is the copy of which the user has traditionally had possession and control. The concept of 'ownership' may be seen to have two distinct meanings in copyright. Specifically, the 'owner' of the copyright work is vested with the exclusive economic rights of reproduction, distribution etc as well as the right to authorise third parties to perform any of these.⁷⁸ Copyright's commoditisation of content also allows authorised copies to be bought and sold, which leads to the second meaning: ownership of the copy as personal property,⁷⁹ along with the associated doctrine of exhaustion which has mediated this space between copyright ownership and personal ownership. Although theoretically distinct, copyright ownership and ownership of the copy are also invariably linked; what it means to own the copy depends on what rights the copyright owner has reserved,⁸⁰ but '... digital distribution changes our relationship to the copy'.⁸¹ From looking at the licence terms highlighted above, it is evident that users of such music streaming services have no personal ownership of the content they may pay for or subscribe to. These licences are also largely homogenised and negate any notion of personal property of content that may have been 'purchased'.

This creates tension with the doctrine of exhaustion, which provides a limitation on the economic right of distribution that copyright owners are vested with. Article 4(2) of the InfoSoc Directive and the US Copyright Act 1976⁸² state that any subsequent distribution of a copy of a work previously put into circulation is not an infringement. Therefore, a rightsholder cannot control subsequent distribution of a work once it has already been lawfully sold in the market, and this allows secondary markets to form. These traditionally operate in respect to tangible copies of works (CDs, DVDs, books etc) that are owned by the consumers who initially purchase them and then wish to dispose of them. Owing to the fact that the licence terms of the streaming services, analysed above, do not grant any personal ownership rights to their users, this seems to prohibit any such markets being formed for digital music content.

However, it is questionable whether copyright law permits secondary markets for digital products in the first place. Digital technologies are copy-based, therefore implicating the right of reproduction over distribution and to which exhaustion does not apply. This can also be evidenced by examining recent court decisions on the issue from the US and Court of Justice of the European Union (CJEU).

Initially, it appeared that secondary markets could exist for digital products, at least in the case of computer software. In 2012, the CJEU delivered its judgment in the case of *UsedSoft v Oracle*⁸³

⁷⁵Perzanowski and Schultz, above n 58, at 1248.

⁷⁶Ibid, at 1214 and IFPI reports, above n 26.

⁷⁷J Liu 'Owning digital copies: copyright law and the incidents of copy ownership' (2001) 42 William & Mary Law Review 1245 at 1280.

⁷⁸Copyright, Designs and Patents Act 1988, s 16.

⁷⁹Perzanowski and Schultz, above n 58, at 1213.

⁸⁰Ibid, at 1223.

⁸¹Ibid, at 1215.

⁸²Copyright Act of 1976, Pub L No 94-553, 90 Stat 2541 (for the general revision of copyright law, title 17 of the United States Code, and for other purposes), 19 October 1976.

⁸³Case C-128/11 *UsedSoft GmbH v Oracle International Corp.*

concerning the application of the principle of exhaustion to computer programs under Article 4(2) of the Computer Programs Directive⁸⁴ which states that the first sale of a program in the Community exhausts the distribution right in respect of that copy. In this particular case, Oracle distributed their software online such that a customer would download it under a licence agreement permitting the right to store a copy of the program permanently and allowing a defined number of users to access it, such that two licences would be required where that number would be exceeded. Updates and patches would also be available to download from Oracle's website and, crucially, the licence agreement was stated to last for an 'unlimited period'. UsedSoft markets used software licences, including those for Oracle's proprietary software where extra users were required, and they induced their customers to copy Oracle's program on to those users' computers. The CJEU was called on to consider whether a UsedSoft customer who does not hold a user right in Oracle's program can benefit from the principle of exhaustion so as to therefore be a 'lawful acquirer' of it under the Computer Programs Directive.

The Court analysed the nature of the contractual relationship between the Oracle and the customer to determine whether the downloading of the software amounted to a first sale of a copy of the program under Article 4(2) of the Directive. It found that the downloading of the software and the conclusion of the licence agreement formed an 'indivisible whole',⁸⁵ especially given the licence granted unlimited duration of use. This, therefore, amounted to a transfer of ownership regardless of the medium (as a download or on a CD-ROM which was a customer option).⁸⁶

Acknowledging the opinion of the Advocate General, the Court noted that if the term 'sale' were not given a wide interpretation, the effectiveness of Article 4 would be hindered, as software suppliers would be able to simply circumvent it through referring to the contract (of sale) as a licence.⁸⁷ No distinction was made between tangible and intangible form⁸⁸ concerning the product's format at acquisition, although the reasoning of the court suggests that this may not be an issue regarding exhaustion:

... the exhaustion of the distribution right ... concerns both tangible and intangible copies of a computer program and hence also copies of programs which, on the occasion of their first sale, have been downloaded from the internet onto the first acquirer's computer.⁸⁹

This was because the physical sale and the download were deemed similar from an economic perspective⁹⁰ and were held to cover any relevant updates or patches.⁹¹ An important proviso exists in that the original user must render their copy unusable at the time of resale to avoid infringement under the Computer Programs Directive and the InfoSoc Directive,⁹² which, in this context, can involve the use of TPMs, whether 'classic' or 'digital' to ensure this is the case.⁹³

Nonetheless, this case has limited applicability. As the Court twice reiterated, the legal issues here constituted a *lex specialis*⁹⁴ such that the protection of computer programs and exhaustion of rights therein are confined to this specific type of subject-matter under the Computer Programs Directive and are not extended to the InfoSoc Directive. This is seemingly confirmed when read with the

⁸⁴Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs.

⁸⁵*UsedSoft v Oracle*, above n 83, para 44.

⁸⁶*Ibid*, paras 45–47.

⁸⁷Case C-128/11 *UsedSoft v Oracle*, Opinion of AG Bot, para 59.

⁸⁸*UsedSoft v Oracle*, above n 83, para 55.

⁸⁹*Ibid*, para 59.

⁹⁰*Ibid*, para 61.

⁹¹*Ibid*, paras 67–68.

⁹²*Ibid*, para 78.

⁹³*Ibid*, para 79.

⁹⁴*Ibid*, paras 51 and 56.

case of *Nintendo v PC Box*,⁹⁵ a case which also involved the legitimacy of devices that circumvented TPMs. In that regard, it was deemed that PC Box's modifications ('mod chips') circumventing Nintendo's DRM (operating concurrently between the video game and console) enabling third-party applications to be used, is something that Article 6 of the InfoSoc Directive is designed to protect against. However, it must be determined what, if any, other purposes such a circumvention device may be used for, and whether or not such purposes are purely geared towards copyright infringement or something different and/or non-infringing.⁹⁶

In contrast to *UsedSoft*, this case was heard under the InfoSoc Directive and caused the Court to consider the type of copyright subject-matter computer games constitute. As much as they comprise of a computer program, they were held to be 'complex matter', including audio and graphical components which may 'have a unique and creative value'.⁹⁷ As such, they lie beyond the purview of the Computer Programs Directive and this case serves to confine the effect of *UsedSoft* to purely computer programs (and not computer games). As such, early suggestions from the industry concerning new secondary markets for computer games were premature. When it comes to other categories of copyright works, the cases of *ReDigi*⁹⁸ in the US along with *Art & Allposters*⁹⁹ and *Tom Kabinet*¹⁰⁰ in Europe seem to further confirm a lack of viable secondary markets for digital content in these jurisdictions.

ReDigi is an online marketplace for pre-owned digital goods that enables registered users to trade their legally purchased, but unwanted, digital content (ebooks and music) utilising a credit-based system. In 2013, Capitol Records sued the company on the basis that its operation amounts to copyright infringement. In much the same way as secondary markets for physical media permit, it allows consumers (or in this case, users) to recoup the value of their purchases. Presumably then, the doctrine of exhaustion would also apply in much the same way.

The system utilised cloud-based technology for which the user must download ReDigi's 'Media Manager' which determined the eligibility of content on the user's computer to be sold. From this list, the user can then upload their eligible files to the 'Cloud Locker', and it was this particular aspect of ReDigi's operation that the case focused on, with Capitol asserting that this necessarily involved reproduction in contravention of the US Copyright Act. For the District Court:

The novel question presented in this action is whether a digital music file, lawfully made and purchased, may be resold by its owner through ReDigi under the first sale doctrine. The Court determines that it cannot.¹⁰¹

Referring to the *Napster* decision¹⁰² as well as citing evidence from the Act itself, its legislative history (House and Senate reports), and the 'laws of physics'¹⁰³ the embodiment of a digital music file on the hard disk of a different user constituted a reproduction within the meaning of the Act. However, the case is interesting because unlike unauthorised file-sharing and the associated operation of p2p networks, ReDigi's users 'migrated' their copy of the work to the cloud such that it then ceased to exist on the user's computer (any additional copies would also be deleted). Nonetheless, according to the Court: '... it is the creation of a *new* material object and not an *additional* material object that defines the reproduction right'.¹⁰⁴

⁹⁵Case C-355/21 *Nintendo Co Ltd v PC Box Srl*.

⁹⁶*Ibid*, para 36.

⁹⁷*Ibid*, para 23.

⁹⁸*Capitol Records, LLC v ReDigi Inc*, 934 F Supp 2d 640 (SDNY 2013).

⁹⁹Case C-419/13 *Art & Allposters International BV v Stichting Pictoright*.

¹⁰⁰Case C-263/18 *Nederlands Uitgeversverbond and Groep Algemene Uitgevers v Tom Kabinet Internet BV and Others*.

¹⁰¹*Capitol Records v ReDigi*, above n 98, p 4.

¹⁰²*A&M Records Inc v Napster Inc*, 239 F3d 1004 (2001).

¹⁰³*Capitol Records v ReDigi*, above n 98, p 6.

¹⁰⁴*Ibid*, p 6.

The application of the first sale doctrine as considered by the Court evidences a similarly narrow reading. Given that a ‘new’ copy was created upon upload, the user was deemed not to be selling their ‘particular’ (personal) copy of a work¹⁰⁵ and that defence was therefore inapplicable. The Court held that this defence was limited to material items (regardless of the fact that the previously mentioned laws of physics dictate that a computer file constitutes a physical location on a hard disk). As such, ReDigi were distributing: ‘... new material objects’.¹⁰⁶ This decision was affirmed by Court of Appeals for the Second Circuit.¹⁰⁷ However, it must be borne in mind that the licences described above do not actually permit any personal ownership of a ‘particular’ copy that could be traded on a secondary digital market.

Similar reasoning regarding the application of exhaustion and the requirement of tangibility can be seen from the CJEU in the case of *Art & Allposters International BV v Stichting Pictoright*.¹⁰⁸ This case concerned the production and sale of altered versions of copyrighted artworks whereby authorised posters of artworks were transferred by Art & Allposters on to canvas and sold online. As framed by the CJEU, the essential question was the applicability of Article 4(2) of the InfoSoc Directive in circumstances where the original work ‘...has undergone an alteration of its medium’.¹⁰⁹ Crucially, recital 28 of the Directive makes reference to work incorporated in a ‘tangible article’. However, just as importantly, the process by which Art & Allposters carried out the process meant that the original poster ceased to exist. A synthetic coating was applied to the poster such that the artwork was transferred from it to the new canvas surface;¹¹⁰ as such, the medium was ‘replaced’¹¹¹ despite the fact that the physical ink was not altered¹¹² and multiple copies were not created. However, the CJEU determined that the physical object placed on the market by the rightsholder was different to that created by Art & Allposters such that exhaustion did not apply to the altered work; it was deemed to be a new reproduction¹¹³ in the same way that ReDigi’s service created a new ‘material object’. In contrast to *Usedsoft*, the medium and ‘new’ reproductions (in the literal sense of the word) of the work in these cases were centrally important to the decisions.

The primary mode for secondary markets for copyright content is intrinsically related to the medium in which the work was initially put on the market by the rightsholder and the forum through which the relevant secondary market may operate. Article 4 of the InfoSoc Directive, concerning reproduction, focuses on reproduction of a tangible article, as evidenced by recital 28. Any change therein results in the creation of a ‘new’ copy that is not subject to the principles of exhaustion, despite the original copy ceasing to exist. However, recital 29 makes clear that exhaustion does not apply to online services, and this was most recently affirmed in *Tom Kabinet*.¹¹⁴ Unlike liability under the right of reproduction which was the focus in *ReDigi* and *Art & Allposters*, this case concerned the right of communication. Here, the provision of an online marketplace for secondhand ebooks was deemed unlawful; the digital content was ‘made available’ to the public therefore constituting a communication under the InfoSoc Directive and established case law.¹¹⁵

A distinction must, and should, be drawn between both the subject-matter and economic rights concerned in these cases. As Advocate General Szpunar opined in *Tom Kabinet*, in the case of literary, musical or cinematographic works, the usefulness is often exhausted, so to speak, after a single reading, hearing or viewing.¹¹⁶

¹⁰⁵Ibid, p 12.

¹⁰⁶Ibid, p 12.

¹⁰⁷*Capitol Records LLC v ReDigi Inc*, No 16-2321 (2d Cir 2018).

¹⁰⁸Case C-419/13 *Art & Allposters International BV v Stichting Pictoright*.

¹⁰⁹Ibid, para 23.

¹¹⁰Ibid, para 15.

¹¹¹Ibid, para 42.

¹¹²Ibid, para 44.

¹¹³Ibid, para 46.

¹¹⁴*Nederlands Uitgeversverbond and Groep Algemene Uitgevers v Tom Kabinet Internet BV*, above n 100.

¹¹⁵Ibid, paras 61–72.

¹¹⁶Case C-263/18 *Tom Kabinet*, Opinion of AG Szpunar, para 61.

This can be contrasted with computer programs, which supposedly have a longer period of ‘use’ although, as Advocate General Szpunar noted, they also become obsolete relatively quickly.¹¹⁷ Nonetheless, digital music and ebooks etc retain their usefulness and, by extension, their economic value to the rightsholder. As a consequence, this type of secondary market was deemed to have a much greater value to rightsholders.

These court decisions related to the specifics of the legislation and rights concerned, as well as the relevant subject matter, and have largely negated the ability for independent secondary markets for digital content to develop. As the founders of the Tom Kabinet platform noted following the decision, ‘Tom Kabinet’s story ends here’.¹¹⁸

Arguable, streaming platforms themselves are now providing a secondary market for content, be it music or other media – a ‘one-stop shop’ where consumers can access newly released content, but also older content that they may otherwise have acquired through traditional transactions involving physical media. Such paid-for, subscription-based, or rightsholder-controlled secondary markets are developing across the copyright industries, particularly in TV and movie sectors with the launch of new services from Disney (‘Disney+’)¹¹⁹ and ‘BritBox’ in the UK, a joint streaming service recently launched by the BBC and ITV.¹²⁰ This was described by the then BBC Director General, Lord Hall, as a ‘modern-day’ version of watching a programme on television and subsequently purchasing it on DVD.¹²¹ However, the difference here is the continued remuneration to rightsholders, compared to the exhaustion of their rights and, therefore, remuneration after lawfully putting a copy of a work on the market. Unlike secondary markets for physical media, these are virtual markets which rightsholders and intermediaries can also exercise control over through the use of DRM.

This is because today’s Internet is, arguably, mostly concerned with connecting people *with* content¹²² rather than providing them with copies of it. DRM ensures that streaming platforms can maintain an ongoing relationship with users through subscription models and as an integral component of content provision. A music stream can be controlled by the rightsholder who can thus condition how a user apprehends and consumes content.¹²³ Despite this, many services purport to offer a degree of freedom commensurate with personal ownership of music. Just as Apple advertised ‘Rip. Mix. Burn’ in 2001 with the launch of the iMac, so Spotify today advertises ‘Any track, any time, anywhere’,¹²⁴ as well as ‘Listen on the go’ and ‘Play your favourites any time’.¹²⁵

As mentioned, usage rules should result from a bargaining process in which users are involved. Users may have the benefit of convenience, but this is *not* a consequence of their role in any bargaining process, with unilateral, or bilateral decisions taken (by, or between, rightsholders) regarding content distribution and supported by protective licence agreements. By maximising their return by internalising transaction costs through DRM, external costs may be created for consumers through

¹¹⁷Ibid, paras 61–62.

¹¹⁸See webpage available at <https://web.archive.org/web/20200606215639/https://www.tomkabinet.nl/>.

¹¹⁹M Sorrentino and JE Solsman ‘Disney plus: everything to know about Disney’s streaming service’ (*CNET*, 4 May 2020), available at <https://www.cnet.com/news/disney-plus-streaming-service-release-date-price-shows-and-movies-to-expect-hulu-espn-plus/>.

¹²⁰‘Full stream ahead for BritBox in UK as ITV and BBC sign agreement’ (*BBC Media Centre*, 19 July 2019), available at <https://www.bbc.co.uk/mediacentre/latestnews/2019/britbox-agreement>.

¹²¹‘BritBox: ITV and BBC set out plans for new streaming service’ (*BBC News*, 19 July 2019), available at <https://www.bbc.co.uk/news/entertainment-arts-49037855>.

¹²²J Kurose ‘Content-centric networking’ (2012) 55(1) *Communications of the ACM* 116.

¹²³JC Ginsburg ‘From having copies to experiencing works: the development of an access right in US copyright law’ (2002–2003) 50 *J Copyright Society USA* 113 at 115 and S Dusollier ‘Electrifying the fence: the legal protection of technological measures for protecting copyright’ (1999) 21(6) *European Intellectual Property Review* 285 at 291.

¹²⁴J Lowensohn ‘Spotify: Thursday’s the day for US launch’ (*CNET*, 13 July 2011), available at <https://www.cnet.com/news/spotify-thursdays-the-day-for-u-s-launch/>.

¹²⁵See https://play.google.com/store/apps/details?id=com.spotify.music&hl=en_GB.

restrictive licencing terms as well as potential technological lock-in.¹²⁶ This leads to increasingly limited ability to seek out alternative markets for digital content consumption beyond the subscription-based models currently in operation.¹²⁷ Alternatively though, it could just as easily be argued that these services have successfully replaced the need for such alternative markets by providing consumers with choice, ease and convenience as well as maintaining incentives to create and release music.

Nonetheless, the current market structure perhaps creates further consequences yet to be fully felt, relating to musical diversity, musical composition and the very nature of the Internet itself, to which attention will now turn.

(b) Musical diversity and composition

The on-demand nature of streamed music, supported by DRM, suggests that new artists may face difficulties if seeking to break into the charts because established acts can dominate several chart positions at once following the release of new material, which may be ultimately detrimental to musical diversity. In this regard, a related consequence of streaming is that albums themselves may be de-bundled (or indeed replaced by ‘playlists’) and the chart-eligibility of streamed music from 2014 allows the opportunity for this phenomenon to occur when previously it could not.¹²⁸ For example, in March 2017 the artist Ed Sheeran occupied 16 out of the top 20 chart positions with songs from his latest album ‘Divide’.¹²⁹ Similarly, the US artist Drake spent 14 weeks at number one with the track ‘One Dance’ as a consequence of streaming consumption, when sales-only data would have placed it at number one for only three weeks.¹³⁰ As a result, it has been suggested that the charts themselves have stagnated, lack diversity and/or there is a lack of quality new artists emerging. For example, a study by the BBC found that in the first six months of 2016, there were 86 new entries in the UK singles chart, compared to 230 ten years previously. Similarly, 11 songs reached number one in 2016, compared to 26 in 2015 and 42 in 2014.¹³¹ The examples highlighted above have led to a change in chart eligibility rules for streamed music with the ratio of streams per-play changing from 100:1 to 150:1 for newer releases and to 300:1 for older tracks which will apply after three consecutive weeks of declining streams.¹³² This so-called ‘Accelerated Chart Ratio’ cannot be applied to any track that has spent fewer than nine weeks in the chart.¹³³ Whilst this may mitigate similar phenomena happening again, the market performance for music has a deeper dynamic and is not purely based on ‘popularity’.

It can also be argued that the music industry has become much more risk-adverse following the Napster era, when peer-to-peer file-sharing significantly reduced revenues. Although these are being restored, the dominance of streaming has also affected the composition of popular music,

¹²⁶For example, Amazon’s Kindle only supports ebooks from Amazon’s own marketplace. This can be altered, but requires third-party software and a degree of technical ability. See <https://uk.pcmag.com/ebook-readers/41944/how-to-put-free-ebooks-on-your-amazon-kindle>.

¹²⁷It should be noted that alternative models do exist, such as those supported by Creative Commons licensing as well as others, for example Bandcamp.

¹²⁸‘Streaming and the Official Singles Chart: Everything you need to know!’ *Official Charts Company* (23 June 2014), available at <https://www.officialcharts.com/chart-news/streaming-and-the-official-singles-chart-everything-you-need-to-know-4253/>.

¹²⁹P Sexton ‘Ed Sheeran Still “Divide”s & Conquers on UK Charts’ *Billboard* (17 March 2017), available at <https://www.billboard.com/articles/columns/chart-beat/7728615/ed-sheeran-uk-charts-divide-shape-of-you-number-one>.

¹³⁰M Savage ‘Has streaming broken the UK singles chart?’ (*BBC News*, 17 July 2016), available from <https://www.bbc.co.uk/news/entertainment-arts-36794105>.

¹³¹M Savage ‘Chart company changes formula to reflect rise in streaming’ (*BBC News*, 19 December 2016), available at <https://www.bbc.co.uk/news/entertainment-arts-38364237>.

¹³²M Savage ‘Ed Sheeran penalised by new chart rules’ *BBC News* (7 July 2017), available at <https://www.bbc.co.uk/news/entertainment-arts-40531119>. See also ‘Rules for chart eligibility: singles’ (*Official Charts Company*, January 2020) p 7, available at <https://www.officialcharts.com/media/657559/official-uk-singles-chart-rules-jan-2020.pdf>.

¹³³*Ibid*, p 7.

and by extension may impact artists themselves. A study by Gauvin in 2017¹³⁴ established that song intros (ie the period of time before the vocal appears) have reduced from an average of over twenty seconds in the 1980s to an average of five seconds by 2015.¹³⁵ This research utilises theory from ‘attention economics’ highlighting that:

...in an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.¹³⁶

This is perhaps especially prevalent with the Internet where ‘... The economy of attention – not information – is the natural economy of cyberspace’.¹³⁷ With streaming services, the attention span of listeners has perhaps decreased as it is easy to skip a track if it does not instantly appeal.¹³⁸ As well as this, there is simply an abundance of information, or in this instance music, for the consumer to process; Spotify provides streaming to over fifty million songs and access to over two billion playlists.¹³⁹ Whilst this change in composition may be seen to be consistent with attention economy principles, it should not necessarily come as a surprise.¹⁴⁰ ‘Standards’ or aesthetics in musical composition have changed over the decades through evolutions in audience, age and phonographic media formats: ‘... a standard develops as the result of its clear location in the popular music consciousness of a particular generational cohort at a specific time and place...’.¹⁴¹ By extension, this can also explain why certain songs are favoured by certain generations of listeners. The memory systems of the brain are intrinsically linked to preferences for music first heard between the ages of 10 and 30¹⁴² which evoke more specific autobiographical memories and emotions than music heard in later life¹⁴³ – the so-called ‘reminiscence bump’. Streaming therefore provides ample long tail provision of content that generationally-orientated users keep returning to. Recent data released by the British Phonographic Industry shows that the reach of streaming is permeating the long tail of musical content¹⁴⁴ with streams of the most popular songs from the 1960s–1990s comparing relatively favourably to those of more recent years. Spotify’s own studies also reveal that the popularity of newly released music peaks in its second year of release,¹⁴⁵ which could indicate more of a ‘slow burn’ in contrast to the traditional dominance of ‘hits’ that the chart system is designed to reflect.

¹³⁴HL Gauvin ‘Drawing listener attention in popular music: testing five musical features arising from the theory of attention economy’ (2018) 22(3) *Musicae Scientiae* 291.

¹³⁵M Crane ‘Has music streaming killed the instrumental intro?’ (*Ohio State News*, 4 April 2017), available at <https://news.osu.edu/has-music-streaming-killed-the-instrumental-intro/> and ‘The dying art of the great song intro’ (*BBC News*, 4 October 2017), available at <https://www.bbc.co.uk/news/entertainment-arts-41500692>.

¹³⁶HA Simon ‘Designing organizations for an information-rich world’ (1971) p 40, available at <https://digitalcollections.library.cmu.edu/awweb/awarchive?type=file&item=33748>.

¹³⁷MH Goldhaber ‘Attention shoppers!’ (*Wired*, 21 January 1997), available at <https://www.wired.com/1997/12/es-attention/>.

¹³⁸Gauvin, above n 134, at 300, citing P Lamere ‘The skip’ (*Music Machinery*, 2 May 2014), available at <https://musicmachinery.com/2014/05/02/the-skip/>.

¹³⁹‘Company Info’ *Spotify*, available at <https://newsroom.spotify.com/company-info/>.

¹⁴⁰Gauvin, above n 134, at 301.

¹⁴¹K Keightley ‘You keep coming back like a song: adult audiences, taste panics, and the idea of the standard’ (2001) 13 *Journal of Popular Music Studies* 7 at 23.

¹⁴²‘Why the music we love as teens stays with us for life’ *BBC Radio* 3, available at <https://www.bbc.co.uk/programmes/articles/WYbJdPrX3qn17F1YYK36sS/why-the-music-we-love-as-teens-stays-with-us-for-life>.

¹⁴³CJ Stevens ‘Is memory for music special?’ (2015) 8(3) *Memory Studies* 263 at 264.

¹⁴⁴M Savage ‘The UK’s most-streamed songs may surprise you’ (*BBC News*, 11 April 2019), available at <https://www.bbc.co.uk/news/entertainment-arts-47881992>.

¹⁴⁵‘Does the music industry’s definition of “catalogue” need an upgrade?’ (*Music Business Worldwide*, 5 December 2017), available at <https://www.musicbusinessworldwide.com/music-industrys-definition-catalogue-need-upgrade/>.

Whilst physical media imbued a certain ‘permanence’ to recordings,¹⁴⁶ the shift to streaming perhaps lessened this, as a consequence of generational change, rising streaming-based consumption and the high levels of competition for listeners’ attention. It appears that the key to success is managing listener’s engagement – as mentioned above, connecting users *with* content is necessary at an initial level, but more so *maintaining* their attention. Along with the evolution of the chart system and the changing composition of popular music, there is clearly a major shift happening in the dynamics of the music industry and the market, beyond the initial ‘surge’ in frontline sales associated with physical formats.

(c) Internet architecture

Further consequences may also be felt in relation to the evolution and even the operation of the Internet itself. The modern role of DRM may be seen as being aimed at the architectural elements of the Internet that are concerned with the efficient transport of content,¹⁴⁷ but the Internet was (arguably) never designed as a commercially structured medium for selling digital data.¹⁴⁸ DRM operates as a form of architectural regulation as architectural distribution mechanisms have developed beyond the peer-to-peer architecture common in the 2000s. It was stated in 1995 that the delivery on demand will be the preferred communication pattern on the Internet¹⁴⁹ and such ‘transport’ of content now takes place via content streaming, with downloading becoming less necessary.¹⁵⁰

Arguably, the Internet’s most important feature (and its main strength¹⁵¹) is its open architecture: ‘Fortunately, nobody owns the Internet, there is no centralised control’.¹⁵² Delving into the technical literature associated with the development of the technology is instructive in this regard. The Internet is not optimised; instead, the goals of the network are flexibility and evolvability:¹⁵³ ‘Systems that are more closed tend to allocate power to the owner of the system’.¹⁵⁴ It is designed to maximise interoperability, and to be independent of software programs, hardware platforms and other technologies. This ‘... is its greatest virtue since it encourages greater participation in the form of new technologies and applications that help shape and reshape the entire network’.¹⁵⁵

Related to this is the principle of ‘end-to-end’ (e2e) which has been latent in the Internet’s design for many years.¹⁵⁶ This architectural principle was envisaged in the early 1980s and described the process whereby ‘the function in question can completely and correctly be implemented only with the knowledge and help of the application standing at the endpoints of the communication system’.¹⁵⁷

¹⁴⁶Keightley, above n 141, at 29.

¹⁴⁷RA Heverly ‘Breaking the internet: international efforts to play the middle against the ends – a way forward’ (2011) 44 *Georgetown Journal of International Law* 1083 at 1086.

¹⁴⁸Negativland ‘Two relationships to a cultural public domain’ (2003) 66 *Law and Contemporary Problems* 239 at 246.

¹⁴⁹PB Hugenholtz *The Future of Copyright in a Digital Environment: Proceedings of the Royal Academy Colloquium* (The Hague: Kluwer Law International, 1996) p 91.

¹⁵⁰Borghi, above n 28, at 317.

¹⁵¹M Castells *The Internet Galaxy: Reflections on the Internet, Business and Society* (Oxford: Oxford University Press, 2007) p 27.

¹⁵²B Carpenter (ed) ‘Architectural principles of the internet’ (1996) IAB 3, available at <https://tools.ietf.org/html/rfc1958>.

¹⁵³DD Clark ‘An insider’s guide to the internet (version 2.0)’ *MIT Computer Science and Artificial Intelligence Laboratory* (25 July 2004) p 2, available at <https://groups.csail.mit.edu/ana/Publications/PubPDFs/An-Insiders-Guide-to-the-Internet.pdf>.

¹⁵⁴D Clark ‘Characterising cyberspace: past, present and future (version 1.2)’ *MIT Computer Science and Artificial Intelligence Laboratory* (12 March 2010) p 7, available at https://projects.csail.mit.edu/ecir/wiki/images/7/77/Clark_Characterizing_cyberspace_1-2r.pdf.

¹⁵⁵RA Spinello *Regulating Cyberspace: The Policies and Technologies of Control* (London: Quorum Books, 2002) p 30.

¹⁵⁶MA Lemley and L Lessig ‘The end of end-to-end: preserving the architecture of the internet in the broadband era’ (2001) 48 *UCLA Law Review* 925 at 930.

¹⁵⁷JH Saltzer et al ‘End-to-end arguments in system design’ (1984) 2(4) *ACM Transactions on Computer Systems* 277 at 278.

Put another way, if the system end-points (ie Internet users) cannot be trusted, then this may imply the development of mechanisms on the network itself to enforce ‘good’ behaviour¹⁵⁸ through interventions to protect copyright.¹⁵⁹ This implicates DRM as a network issue: ‘As trust erodes, both end-points and third parties may wish to interpose intermediate elements into a communication to achieve verification and control’.¹⁶⁰

As mentioned previously, DRM’s role in relation to content streaming can create technological lock-in, and such power concentration has been noted by the Internet Architecture Board as being a ‘concerning phenomenon’ as recently as September 2020.¹⁶¹ Issues here relate to hardware and software ecosystems; the stream of data must be routed through the device, which must have some ability to see what sort of information is in the stream so it can make the necessary processing decisions.¹⁶² Although there is not a readily apparent relationship between this and the role of copyright itself, the anti-circumvention provisions highlighted above now provide this link such that circumventing such a system is an offence in the same way that copyright infringement may be illegal. As a consequence, it can also be used to regulate technologies to create and maintain such ecosystems. Apple has become an important digital gatekeeper for the content industries,¹⁶³ through transforming itself from a technology-based company, to an entertainment-based one.¹⁶⁴ Steve Jobs himself came to play a major role in shaping the strategy of rights-holders¹⁶⁵ although, ironically, he did not favour a subscription-based distribution model.¹⁶⁶ The role of DRM also contributed to this, initially through attempts to develop the ‘Secure Digital Music Initiative’ as a standard encryption format for music files in 2002.¹⁶⁷ Although this ultimately ended without agreement due to the conflicting interests of those involved, that did not mean that the issue faded:

Meanwhile, unbeknownst to most of the panel members, another group of smart, hi-tech business people was watching the proceedings very, very carefully. It was Apple Computer... [who] decided they could do a far better job.¹⁶⁸

Apple’s then proprietary ‘FairPlay’ DRM system benefited them much more than the labels as it locked consumers into Apple products.¹⁶⁹ This ‘lock-in’ created an Apple ‘ecosystem’ that essentially tied its product range together for commercial transactions¹⁷⁰ (originally driven by the iPod¹⁷¹) such that they were mutually reinforcing. Originally, this was between Apple’s iTunes software and the iPod,¹⁷² but now extends to their other technology products (in particular the iPhone and iWatch) which have strengthened their ecosystem.

¹⁵⁸MS Blumenthal and DD Clark ‘Rethinking the design of the internet: the end-to-end arguments vs the brave new world’ (2001) 1(1) ACM Transactions on Internet Technology 70 at 91.

¹⁵⁹Ibid, at 77.

¹⁶⁰Ibid, at 93–94.

¹⁶¹M Nottingham ‘The internet is for end users’ (*Internet Architecture Board*, 11 September 2020), available at <https://tools.ietf.org/id/draft-nottingham-for-the-users-07.html>.

¹⁶²Blumenthal and Clarke, above n 158, at 83.

¹⁶³N Anderson ‘Why DRM’s best friend might just be Apple Inc’ (*Ars Technica*, 1 November 2007), available at <https://arstechnica.com/uncategorized/2007/01/8595/>.

¹⁶⁴NF Sharpe and AB Olufunmilayo ‘Is Apple playing fair? Navigating the iPod FairPlay DRM controversy’ (2007) 5 *Northwestern Journal of Technology and Intellectual Property* 332 at 332.

¹⁶⁵G Kot *Ripped: How the Wired Generation Revolutionized Music* (New York: Scribner, 2009) p 203.

¹⁶⁶Knopper, above n 19, p 238.

¹⁶⁷Ibid, pp 150–157.

¹⁶⁸Ibid, p 156.

¹⁶⁹Ibid, p 232.

¹⁷⁰Anderson, above n 163.

¹⁷¹Sharpe and Olufunmilayo, above n 164, at 333–334.

¹⁷²Kot, above n 165, pp 202–203.

This is also how Apple operates – entering a new market and refining its products and services until it yields success.¹⁷³ This interconnected nature of Apple’s products and services is an important part of its business strategy,¹⁷⁴ as well as the rigidity of its business practice: ‘Apple is a stalwart on its pricing scheme’.¹⁷⁵ It has now, however, spun out its iTunes service into four distinct parts (Apple Music, Apple Podcasts, Apple TV and Finder) to further drive users into its software and services.¹⁷⁶ Music consumption is no longer about ripping, mixing and burning, but again connecting users with content on proprietary platforms and networks. This interconnected nature between products and content (even if the content is DRM-free) therefore highlights the importance of rightsholder-controlled digital distribution networks on which the rightsholder and/or streaming platform is most likely to add services (and thus constraints) by modifying the part of the network that they control.¹⁷⁷

This may lead to what Sir Tim Berners-Lee has referred to as ‘fragmentation’ and whilst he was referring more specifically to social media sites, the same analogy could be applied in this context: ‘The more you enter, the more you become locked in...’, and referring to iTunes, ‘You are trapped in a single store, rather than being on the open marketplace’.¹⁷⁸ Therefore, streaming-based distribution of music (supported by DRM and licences) may threaten to create *network fragmentation* whereby centralised and closed distribution networks are prevalent and where DRM operates on the network itself. All of this is in contrast to the decentralised, open and e2e-designed network that originally developed.

Conclusion

The growth of streaming-based music consumption is unlikely to change; it is the dominant mechanism by which such content is consumed online and the recording industry is dependent on its success, especially bearing in mind the major labels have equity stakes in Spotify.¹⁷⁹ DRM plays an important role in this context, enabling such business models in the first place and subsequently protecting and managing the content offered on such platforms. In contrast to its early incarnations, it now operates as an ‘omnipresent connectivity’¹⁸⁰ and is an inescapable necessity.¹⁸¹ Digital networks can now be designed to mirror the traditional industry market norms¹⁸² and re-establish the market practices and market regulation that were threatened by digital technology. Such a content-centric network focuses on what a user wants, with increasing concentration on the delivery of content.¹⁸³ A successful network may increase the available choices to the user, but conversely, restrict interoperability,¹⁸⁴ such that user choices are limited amongst streaming providers and their proffered content. Such restrictions are also evident through the associated licensing terms that these services offer; there is no

¹⁷³T Ricker ‘First click: Apple’s greatest innovation its ecosystem’ (*The Verge*, 7 September 2016), available at <https://www.theverge.com/2016/9/7/12828846/apple-s-greatest-product-is-its-ecosystem>.

¹⁷⁴Sharpe and Olufunmilayo, above n 164, at 340.

¹⁷⁵Anderson, above n 163.

¹⁷⁶J Colcourt ‘RIP, iTunes. This is what happens to your Apple music now’ (*CNET*, 5 July 2019), available at <https://www.cnet.com/how-to/rip-itunes-this-is-what-happens-to-your-apple-music-now/>.

¹⁷⁷Blumenthal and Clark, above n 158, at 92.

¹⁷⁸T Berners-Lee ‘Long live the web: a call for continued open standards and neutrality’ (*Scientific American*, 1 December 2010), available at <https://www.scientificamerican.com/article/long-live-the-web/>.

¹⁷⁹H Lindvall ‘Behind the music: the real reason why the major labels love Spotify’ (*The Guardian*, 17 August 2009), available at <https://www.theguardian.com/music/musicblog/2009/aug/17/major-labels-spotify> and M Arrington ‘This is quite possibly the Spotify cap table’ (*TechCrunch*, 7 August 2009), available at <https://techcrunch.com/2009/08/07/this-is-quite-possibly-the-spotify-cap-table/>.

¹⁸⁰MS Boone ‘The past, present, and future of computing and its impact on digital rights management’ (2008) Michigan State Law Review 413 at 429.

¹⁸¹Sobel, above n 30, at 669.

¹⁸²Ganley, above n 49, at 290–291.

¹⁸³Kurose, above n 122, at 116.

¹⁸⁴Sharpe and Olufunmilayo, above n 164, at 341.

need for them to offer more freedoms when they can simply introduce further restrictions in order to appeal to the record labels, as rightsholders, on whom they depend for content provision.

Such choices may interfere with the ‘value’ of a piece of music as this arises as a result of its utility through consumption:¹⁸⁵ ‘People want to be engaged with their content ... They want to engage in an ongoing relationship...’¹⁸⁶ However, the development of streaming-based and DRM-supported content distribution changes this dynamic. DRM may affect users’ perceptions of their rights,¹⁸⁷ changing their normative behaviour alongside the underlying architecture of digital content consumption:

Nowhere is this transformation more apparent than among young people who have grown up in a digital world and, in some cases, cannot relate to the physical objects of the past.¹⁸⁸

As has been shown, the operation of DRM in conjunction with licence agreements may have few consequences regarding secondary markets, but more so music chart diversity, musical composition, and threatening the fundamental design principles of the Internet. However, the success seemingly enjoyed by streaming providers suggests that these do not seem to be of much (if any) concern to the general public and users of such services; overall, streaming services seem to create a lower incentive to illegally download music. Music on physical media also continues to exist and, in the case of vinyl, has enjoyed a degree of resurgence in the UK due to the Covid-19 pandemic.¹⁸⁹ Nonetheless, these individual issues can be seen at a macro-level that is indicative of a re-establishment of record industry power allied to streaming platforms. This trend is likely to continue and present broader level, unique problems that are related to those already highlighted.

Issues such as streaming piracy, click fraud and the ‘value gap’ have all emerged in recent years and whilst there are attempts to mitigate these in the form of the new Directive on copyright in the Digital Single Market,¹⁹⁰ problems may still remain. The Internet has enabled artists to innovate how they present their work to consumers, but the movement to streaming arguably makes this more difficult. In 2014, the US band Vulfpeck released their album ‘Sleepify’ on Spotify. The album consisted of ten songs of silence lasting between 31 and 32 seconds which they asked their fans to stream on repeat in order to generate sufficient royalties to fund an admission-free tour.¹⁹¹ The album was subsequently removed from the service for violating their terms of content.¹⁹² Although these services offer services for artists themselves, for unsigned acts they involve third parties (who handle licensing and distribution for a fee or percentage).¹⁹³ Even with direct distribution schemes, like those offered by Spotify since 2018,¹⁹⁴ complexities exist and artists may still receive slightly less than the major record

¹⁸⁵BJ Bates ‘Commentary: value and digital rights management – a social economics approach’ (2008) 21(1) *Journal of Media Economics* 53 at 62.

¹⁸⁶MA Lemley ‘Is the sky falling on the content industries?’ (2011) 9 *Journal on Telecommunications and High Technology Law* 125 at 134.

¹⁸⁷CJ Angelopoulos ‘Modern intellectual property legislation: warm for reform’ (2008) 19(2) *Entertainment Law Review* 35 at 37.

¹⁸⁸S Greengard ‘Digitally possessed’ (2012) 55(5) *Communications of the ACM* 14 at 14.

¹⁸⁹M Sweney ‘Back on track: UK vinyl sales heading for best year in three decades’ (*The Guardian*, 21 November 2020), available at <https://www.theguardian.com/business/2020/nov/21/uk-vinyl-sales-gigs-covid-record>.

¹⁹⁰Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC.

¹⁹¹T Jonze ‘Vulfpeck ... the band who made \$20,000 from their “silent” Spotify album’ (*The Guardian*, 25 July 2014), available at <https://www.theguardian.com/music/2014/jul/25/vulpeck-the-band-who-made-20000-from-their-silent-spotify-album>.

¹⁹²H Brown ‘Spotify removes Vulfpeck’s “Sleepify”’ (*Billboard*, 26 April 2014), available at <https://www.billboard.com/articles/6070030/spotify-removes-vulpecks-sleepify>.

¹⁹³‘Getting music on Spotify’, available at <https://artists.spotify.com/help/article/getting-music-on-spotify>.

¹⁹⁴T Ingham ‘Spotify opens the floodgates: artists can now upload tracks direct to the streaming platform for free’ (*Music Business Worldwide*, 20 September 2018), available at <https://www.musicbusinessworldwide.com/spotify-opens-the-floodgates-users-can-now-upload-tracks-to-the-streaming-platform-for-free/>.

labels.¹⁹⁵ Controversies over royalty payments and mechanisms suggest that only artists who are globally established have any bargaining power¹⁹⁶ against these services. It could also be argued that simply being a talented musician is no longer enough: new artists perhaps now need a background in, or require education on, the technology and business practices involved in the streaming-based landscape. They may subsequently find themselves competing for the attention of potential fans through these services and being forced to conform to associated compositional necessities. This may also jeopardise older artists, who either lack familiarity with current practices and technologies, or whose work does not conform to modern standards; artists whose work lies in the long tail that current trends seem to be ignoring and which streaming may either help or exacerbate.

This is being driven in part by DRM, but more broadly by the interrelationship between the record industry and streaming platforms.¹⁹⁷ Copyright also remains centrally important here, but its focus is no longer on enforcing reproduction rights, because the ‘copy’ has been removed from the equation. Technologies and intermediaries have now *evolved* around copyright law. The locus of copyright in this context is moving towards the immediate bundle of rights acquired that enable online exploitation but with little opportunity for copyright’s in-built balancing mechanisms to operate.

¹⁹⁵T Ingham ‘Spotify’s direct distribution deals: what do artists get paid?’ (*Music Business Worldwide*, 23 September 2018), available at <https://www.musicbusinessworldwide.com/spotify-direct-distribution-deals-what-do-the-artists-get/>.

¹⁹⁶C Arthur ‘Taylor Swift may have triumphed, but Apple will still call the tune’ (*The Observer*, 27 June 2015), available at <https://www.theguardian.com/music/2015/jun/27/taylor-swift-triumphed-apple-music-calls-tune>.

¹⁹⁷The industry structure between record companies and retail could now be characterised as concentrated oligopolies. See M Hviid et al ‘Digitalisation and intermediaries in the music industry’ (2018) 15(2) *SCRIPTed* 242 at 273.