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SONG ON WIRE: A TECHNICAL ANALYSIS OF *REDIGI* AND THE PRE-OWNED DIGITAL MEDIA MARKETPLACE

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In October 2011, an online marketplace for reselling pre-owned digital music emerged. The founders of this online marketplace aptly named it ReDigi. In January 2012, ReDigi was promptly sued by Capitol Records for copyright infringement. Despite reassurances from ReDigi that its software required users to delete copies of the music before being allowed to sell it to another user, the court did not consider that safeguard relevant. The court found that the copyright holder's reproduction right was being infringed regardless. This paper examines the intersection of the law and science in copyright law. Specifically, it presents a technical way of looking at the reproduction right by explaining how digital files are stored in data storage devices and transferred over the Internet by electromagnetic signals. Ultimately, this elucidation undermines the reasoning used by the court to reach its conclusion. While ReDigi modified its software implementation to skirt any further reproduction right problems, this paper suggests ReDigi should not have had to be so obedient.

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INTRODUCTION

If you have ever impulsively purchased the latest trendy song on iTunes[1] and then, 34 repetitious plays later, wondered, "*Did I really need that?*", your salvation may have stealthily surfaced in the middle of the night only to be shot down by the sheriff before it could see the sunrise. Just like the time you purchased that Macarena CD in 1995 and then sold it on eBay five years later for a dollar, a new

[1] For those readers of the future where digital content is a relic of the past, iTunes was the leading online marketplace to buy digital media. Users could purchase music, television shows, movies, and books in digital form at prices that were usually less than their tangible counterparts.

wave of businesses have attempted to create a marketplace for the resale of previously owned digital media files. Many such businesses rely on taking a cut from your resale of that Psy album you purchased online while providing you a place to sell it at a discounted price.

This creative business prowess deserves applause, but media companies are less than thrilled. Their quarrel is obvious: As the number of secondhand sales increases, the number of new sales decreases. In some instances, media companies make nothing from the secondhand sales. Accordingly, some media companies have turned to copyright law to protect their content (and their revenue) by claiming that digital resales violate their exclusive rights[2] as owners of the content. If the first big lawsuit[3] on this issue is any indication, such copyright challenges may successfully block the development of a secondhand digital market. Nonetheless, the issue is far from decided. Given the narrow holding in *Capitol Records v. ReDigi, Inc.*, there remain viable options for startups that want to revolutionize the way digital media is bought and sold. Moreover, the *ReDigi* court's reluctance to engage the finer technical aspects of digital media, as compared to traditional media, may leave the door open for disagreement by other courts.

Section I of this note summarizes the facts of the *ReDigi* court, including an analysis of the court's decision on reproduction and distribution rights and ReDigi's attempted fair use and first sale defenses. Section II looks in depth at copyright law's reproduction right and why ReDigi was unsuccessful arguing that its business method did not infringe it. Section III identifies the technical, device-level view of digital files so that the copyright holder's reproduction right is not necessarily infringed if the files are properly transferred. Section IV quickly visits the distribution right under this view. Section V looks at the policy considerations and implications surrounding the *ReDigi* court's decision. Section VI reflects on the future outlook for previously owned digital media markets.

I
REDIGI CASE

On March 30, 2013, the Southern District of New York decided a case in which Capitol Records, a major music publishing company, sued ReDigi, a startup

[2] There are six exclusive rights granted to the owner of the copyrighted work. 17 U.S.C. § 106 (2006). The issue of reselling previously owned digital media focuses on three: the reproduction right, the distribution right, and the public performance right.

[3] Capitol Records, LLC v. ReDigi Inc., 934 F. Supp. 2d 640 (S.D.N.Y. 2013). This case is discussed thoroughly in the next section.

company that allowed its users to resell previously owned music, for copyright infringement.[4] In contrast to the historical practice of selling physical objects like compact discs or vinyl records, ReDigi resold digital media that their users had previously purchased and downloaded from iTunes. The outcome of the case turned on whether ReDigi's service involved the creation of a new – and unauthorized – reproduction of a pre-owned digital file. Despite reassurances from ReDigi that the digital file was eliminated from the subscriber's computer during upload to an individualized storage space hosted by ReDigi (a subscriber's "Cloud Locker"),[5] and hence resulted in a "migration" rather than a reproduction of the media file, the court held that a violation of Capitol Record's reproduction and distribution rights occurred once the file was stored in the Cloud Locker.[6]

A. Facts

Among the facts established at trial was the process by which a digital resale occurs. A ReDigi subscriber downloads ReDigi's Media Manager software, which analyzes the subscriber's computer to create a list of music files available for resale.[7] Only files purchased via iTunes or from another ReDigi user are eligible for resale.[8] This was a legal decision took to ensure the subscriber actually owned — instead of merely licensed — the music file so that the first sale doctrine[9] applied to all subsequent transfers.[10] After the initial analysis, Media Manager continues to run on the subscriber's computer in order to flag any attempts by the subscriber to copy or transfer the file to a remote device. According to ReDigi CEO John Ossemacher, the Media Manager software contains a "really cool forensic engine that . . . determines where the song came from, whether you're the lawful owner, whether it was moved from one computer to another and so on."[11] If

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[4] *Id.*

[5] The files stored in a subscriber's Cloud Locker are, in reality, stored on a server in Arizona. *Id*. at 645.

[6] *Id.* at 650–51.

[7] *Id.* at 645.

[8] *Id.*

[9] More information on the first sale doctrine's applicability to this case is provided *infra* Part I.D.

[10] *See* Def.'s Mem. of Law in Opp'n to Pl.'s Mot. for Prelim. Inj. at 19, Jan. 27, 2012, ECF No. 14 ("[U]nlike the terms of service for Amazon's online music store, the iTunes Terms of Sale ('iTunes TOS') formally provide that *title* to music files downloaded from iTunes *passes to the consumer*." (emphasis in original)).

[11] Matt Peckham, *How ReDigi Lets You Resell Digital Music (and Why It's a Big Deal)*, TIME (June 27, 2012), http://techland.time.com/2012/06/27/how-redigi-lets-you-resell-digital-music-and-why-its-a-big-deal.

a copy is detected, ReDigi asks the subscriber to delete it or face suspension of his account.[12]

The subscriber can choose to upload any authorized file to his Cloud Locker. The upload process is the crux of the lawsuit. While ReDigi asserts that the upload is a *migration* of the original, purchased iTunes file, Capitol Records insists that any upload necessarily involves *copying* the file.[13] Regardless of how one classifies the movement, no file is retained on the subscriber's computer.[14] Thereafter, the subscriber can choose to use the Cloud Locker to stream the music, sell the music, or transfer it back to his computer,[15] but access to the file is terminated once the subscriber sells the music to another subscriber.[16] No money is transferred between the subscribers; instead, subscribers accumulate credits from ReDigi as compensation for the sale. Subscribers may also purchase credits directly. Those credits can then be used to buy additional music, but cannot be exchanged for money.[17] Individual songs are priced between 59–79¢, which is split 20/20/60 between the seller (in the form of credits), the artist, and ReDigi, respectively.[18]

B. Reproduction Right

Artists and their record labels receive a copyright in the sound recording of their music.[19] Sound recordings are works that result from fixation in a material object called a phonorecord, which include disks and tapes.[20] The copyright owner has the exclusive right "to reproduce the copyrighted work in copies or phonorecords."[21]

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[12] *Id.*

[13] *ReDigi*, 934 F. Supp. 2d at 645–46.

[14] *Id.* at 646.

[15] *Id.*

[16] *Id.*

[17] Def.'s Counter Statement Pursuant to Local Rule 56.1 ¶ 18, Aug. 14, 2012, ECF No. 83. It should be noted that the closed credit system was adopted, at least in part, at the behest of the record labels who believed it prudent to keep the money "in the music ecosphere." *Id.* ¶ 19.

[18] *ReDigi*, 934 F. Supp. 2d at 646.

[19] 17 U.S.C. § 102(a)(7) (1990). Artists also receive a copyright in the underlying musical composition. U.S. COPYRIGHT OFFICE, CIRCULAR 56A, COPYRIGHT REGISTRATION OF MUSICAL COMPOSITIONS AND SOUND RECORDINGS (2012), http://www.copyright.gov/circs/circ56a.pdf. This was not an issue in *ReDigi* since the artists were not plaintiffs.

[20] 17 U.S.C. § 101.

[21] 17 U.S.C. § 106(1).

The Southern District of New York recognized the unprecedented nature of the *ReDigi* case from the very beginning. Unlike previous copyright infringement cases that involved duplication of digital files, the issue in this case was "whether the unauthorized transfer of a digital music file over the Internet — where only one file exists before and after the transfer — constitutes reproduction within the meaning of the Copyright Act."[22]

The court reasoned that the copyrighted sound recording constituted a reproduction of the phonorecord once fixed in the subscriber's Cloud Locker after upload. Thus, the Redigi server — a collection of hard drives in Arizona that contained the same sound recording — represented the infringing, reproduced phonorecord. The court did not care whether ReDigi characterize it as a transfer, migration, or pilgrimage because "[i]t is simply impossible that the same 'material object' can be transferred over the Internet."[23] The fact that the file was deleted on the subscriber's computer was irrelevant. Even deletion of the file located in the subscriber's Cloud Locker would be no saving grace. "Simply put, it is the creation of a *new* material object and not an *additional* material object that defines the reproduction right."[24]

C. Distribution Right

The Copyright Act also provides the copyright owner the exclusive right "to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending."[25] ReDigi did not contest that it was distributing the sound recordings.[26] Instead, it relied on defenses under the fair use and first sale sections of the Act[27] to argue it was within its legal rights to distribute the previously owned music.

D. Fair Use and First Sale Defenses

The court promptly dismissed ReDigi's fair use defense, weighing all four factors[28] in the analysis against ReDigi.[29] The court was more deliberate in

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[22] *ReDigi*, 934 F. Supp. 2d at 648.
[23] *Id.* at 649.
[24] *Id.* at 650.
[25] 17 U.S.C. § 106(3).
[26] *ReDigi*, 934 F. Supp. 2d at 651.
[27] 17 U.S.C. § 107 and 17 U.S.C. § 109, respectively.
[28] The factors to be considered in a fair use defense are: "(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the

discarding the first sale defense since, at first glance, reselling used digital music seems akin to reselling used compact discs and vinyl records. However, in contrast to physical sales, the court found it significant that the phonorecord, which was resold and redistributed by ReDigi, had already been unlawfully reproduced, as analyzed above. Since the reproduction was not "lawfully made under this title," as the first sale defense requires, the defense could provide no shield.[30] Whereas the original phonorecord created in the subscriber's computer hard drive would retain the benefit of the first sale defense,[31] under the court's interpretation, that file had been deleted, and with it went the first sale defense. Thus, the infringement of the distribution right in this case was directly tied to the court's decision about whether an illegal reproduction occurred in the first place.

The court found security in its decision due, in large part, to the Copyright Office's report on the Digital Millennium Copyright Act, which explained why the first sale doctrine should not be extended to digital works. The Copyright Office justified its reasoning for limiting the first sale doctrine by noting both the relative difficulty with which physical copies are transported as compared to digital copies, which tends to keep the resale market in check, as well as the fact that physical copies degrade over time, making them less desirable than new copies.[32] On the other hand, "[d]igital information does not degrade, and can be reproduced perfectly on a recipient's computer. The 'used' copy is just as desirable as (in fact, is indistinguishable from) a new copy of the same work."[33]

The court's proposition raises an interesting philosophical question: If digital copies are "indistinguishable," and there is no other phonorecord with which to compare, how can the court know that the phonorecord stored on ReDigi's server is a new phonorecord rather than the original? This question and others will be explored in later sections.

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portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work." 17 U.S.C. § 107.

[29] *ReDigi*, 934 F. Supp. 2d at 652–54.

[30] 17 U.S.C. § 109(a).

[31] Under a strict reading of section 109, the first sale doctrine would apply to the original phonorecord stored in a subscriber's computer hard drive only if the subscriber purchased the right to fix the sound recording in a phonorecord from a store that transferred ownership to that particular phonorecord instead of simply granting a license to use that particular phonorecord. The court never addressed this issue because it resolved the question of the application of first sale defense without regard to the phrasing of the iTunes purchasing agreement. However, ReDigi asserted that ownership was transferred. Def.'s Mem. of Law, *supra* note 10.

[32] U.S. COPYRIGHT OFFICE, DMCA SECTION 104 REPORT 82–83 (2001), *available at* http://www.copyright.gov/reports/studies/dmca/sec-104-report-vol-1.pdf.

[33] *Id.* at 82.

II
REPRODUCTION RIGHT PERTAINING TO PREVIOUSLY OWNED DIGITAL MEDIA

Once ReDigi lost its argument that uploading the digital music files to its Cloud Locker service was not an infringement of the copyright owner's reproduction rights, its remaining arguments and defenses fell along with it.[34] Thus, the critical aspect to the legality of digital media resale seems to be avoiding infringement of reproduction rights.

A. Argument Made By ReDigi

From the very start, ReDigi put itself behind the eight ball. In one of its first memorandums to the court opposing Capitol Records' motion for a preliminary injunction, ReDigi repeatedly, and unfortunately, referred to uploaded music files as "copies" of the music file on the subscriber's computer.[35] After Capitol Records exposed this vulnerability,[36] ReDigi was left trying to explain how the word "copy" was used in its colloquial sense rather than as a term meant to describe reproduction in the legal sense.[37]

ReDigi's unfortunate characterization of its uploading process is understandable given the way modern technology has altered the meaning of several common words such as "chat" and "cookie." The court tried to allay fears that it based its holding on semantics by explaining that even if no copying takes place, "the fact that a file has moved from one material object—the user's computer — to another — the ReDigi server — means that a reproduction has occurred."[38] If the court had accepted the theory that the file was moved, instead of copied, it would need an additional reason to believe that a new phonorecord had been created, as required to infringe the owner's exclusive reproduction rights. In that sense, one cannot

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[34] When the court decided that the subscriber's act of uploading was a reproduction, the court reasoned that the "reproduced" file was not under protection of the first sale defense. Thus, ReDigi also infringed distribution rights by selling the illegally "reproduced" file. From here, the court found ReDigi liable for direct and secondary infringement since it actively participated in, and benefitted from, its subscribers' infringing conduct. *ReDigi*, 934 F. Supp. 2d at 656–60.

[35] Def.'s Mem. of Law, *supra* note 10, at 9 ("The only copying which takes place in the ReDigi service occurs when a user uploads music files to the ReDigi Cloud, thereby storing copies thereof in the user's personal Cloud Locker . . . .").

[36] Pl.'s Reply Mem. of Law in Further Supp. of Pl.'s Mot. for Partial Summ. J. at 1, Aug. 8, 2012, ECF No. 87 ("The only plausible reading of this statement . . . is that uploading delivers a copy of a music file to the ReDigi cloud.").

[37] Def.'s Mem. of Law in Opp'n to Pl.'s Mot. for Partial Summ. J. at 6, Aug. 14, 2012, ECF No. 79.

[38] *ReDigi*, 934 F. Supp. 2d at 650.

help but feel that the opinion was written with a certain degree of skepticism towards ReDigi's recasting of *copying* as *migration* that pervades much of the analysis.

1. Was ReDigi's Argument Dismissed Too Casually?

No matter the operating system — Windows, Mac OS X, Linux, or Unix — all have distinct commands for "copying" as opposed to "moving" a file. When "copying," there are always at least two files in existence after command execution, but when "moving," only one file exists both before and after command execution.[39] Thus, modern technology parlance would suggest that ReDigi is well within its bounds to call its proprietary upload process a move or migration.

ReDigi attempted to use this differentiation to analogize its proprietary technology to the defendant's action in *C. M. Paula Co. v. Logan*, where the defendant transferred — one could say moved — copyrighted prints from the plaintiff's greeting cards and notepads onto ceramic plaques.[40] The images were chemically stripped from the paper they were printed on, temporarily supported by a resin emulsion, before being adhered to the ceramic plaques.[41] The court held that the affixation of the image on the ceramic plaque was not a reproduction or duplication of the print because there was no copying involved.[42] Key in its decision was the fact that the defendant legally purchased another print from the plaintiff every time the defendant wanted to make another ceramic plaque. The court also held that the first sale doctrine protected the defendant from infringing the plaintiff's "exclusive right to vend," otherwise known as the right to

[39] Usually, when a move command is initiated by the user, the operating system simply updates the link that points to the file's location on the hard drive without actually moving where the bits of the file are stored. So, if the user wanted to move the file from directory A to directory B, the operating system would internally manage the "movement" such that the link to the file appears when the user accesses directory B, but not directory A. This does not happen when ReDigi moves the file, however, because the file is being moved from one file system, the subscriber's computer, to a different file system, the subscriber's Cloud Locker. However, moving the file is probably a more appropriate description than copying the file in this case since, regardless of the actual implementation of the move command, the subscriber has no volition, intent, or knowledge of any copying. ReDigi's Media Manager software is proprietary, so a step-by-step analysis of the code cannot be performed. Assuming, however, that ReDigi was aware of the potential copyright issues, it is at least conceivable that it deliberately wrote the software to avoid creating copies. *See* Def.'s Mem. of Law in Further Supp. of ReDigi's Summ. J. Mot. at 6, Aug. 24, 2012, ECF No. 90 (explaining the upload process as "wholly unlike a copy and delete operation, which happens in two distinct steps").

[40] *C. M. Paula Co. v. Logan*, 355 F. Supp. 189, 190 (N. D. Tex. 1973).

[41] *Id.*

[42] *Id.* at 191.

distribute.[43] "[T]he policy favoring a copyright monopoly for authors gives way to the policy opposing restraints of trade and to restraints on alienation."[44]

Since each transferred print was fixed in the resin emulsion before finally being fixed on a ceramic plaque, both of which meet the definition of new material objects, the *ReDigi* court could have argued that the defendant in *C. M. Paula* actually unlawfully reproduced each copyrighted print twice. But the court, rightfully, did not. Instead, it considered the holding in *C. M. Paula* to be based on "questionable merits" and distinguished ReDigi's service from the chemical stripping that occurred in *C. M. Paula*.[45] With chemical stripping, "the copyrighted print, or material object, was lifted from the greeting card and transferred in toto to the ceramic tile; no new material object was created."[46] In contrast, ReDigi's service "creates a new material object when a digital music file is either uploaded to or downloaded from the Cloud Locker."[47]

The distinction presented by the court looks quite natural at first glance. However, this distinction seems to be contrived through clever wordplay in the name of convenience. For, when citing Nimmer on Copyright earlier, the court correctly wrote, "the reproduction right is the exclusive right to embody, and to prevent others from embodying, the copyrighted work (or sound recording) in a new material object (or phonorecord)."[48] But when analyzing *C. M. Paula* a page later, the court loosely interchanges a "copyrighted work" with a "material object," saying that one and the same were lifted from the card.[49] However, the print was transferred separately of the material object; the card (which was the material object in which the print was fixed) actually peeled away.[50] When the court's equating of the copyrighted print to a material object is juxtaposed with its explanation of the reproduction right as preventing someone from embodying a copyrighted work *in a material object*, something is amiss. It is difficult to believe that the print is a material object itself which is also embodied in *another* material object: the card, resin, or a ceramic tile. Without the card, resin, or ceramic tile, it strains logic to imagine an audience perceiving the print (i.e., work) when the

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[43] *Id.*

[44] *Id.*

[45] *ReDigi*, 934 F. Supp. 2d at 650.

[46] *Id.* at 650–51.

[47] *Id.* at 651.

[48] *Id.* at 649.

[49] *Id.* at 650–51 ("There, the copyrighted print, *or material object*, was lifted from the greeting card and transferred in toto to the ceramic tile; no new material object was created.") (emphasis added).

[50] *C. M. Paula*, 355 F. Supp. at 190.

material object is the tangible thing that allows the work to be perceived, reproduced, or otherwise communicated.[51]

If the court is steadfast in its equating the copyrighted print to a material object, in disregard of the Copyright Act's plain language,[52] then ReDigi should also be allowed to equate the copyrighted sound recording (i.e., work) to a material object as well. In essence, ReDigi would be stripping the sound recording (print) from the subscriber's hard drive (paper) and transferring it "in toto" to the Cloud Locker (ceramic tile) without reproduction just as in *C. M. Paula*. No new material object could be said to have been created because, like the ceramic tile, the Cloud Locker already existed as a material object and another material object (i.e., the sound recording) would simply be placed in the Cloud Locker. One could even consider the transitory nature of the sound recording as it passes through network equipment over the Internet analogous to the transitory state of the print in the resin emulsion.

The court would probably insist that its "copyrighted print, or material object" language was being misread. But in order to do this and still conclude, consistently with the *C. M. Paula* court, that no new material object was created, it would have to contend that the copyrighted print was still fixed in the paper when it was stripped from the paper. That contention runs counter to the stripping process in *C. M. Paula* that was described as "involv[ing] the use of acrylic resin . . . as a transfer medium to strip the printed indicia from the original surface on which it is printed. . . ."[53] Thus, *C. M. Paula* actually comports quite nicely with a favorable result for ReDigi.

Despite the aforementioned analysis, the *ReDigi* court used *C. M. Paula* against ReDigi. If the court felt persuaded to find against ReDigi for policy reasons external to the law, the best option for the court may have been just to declare that *C. M. Paula* was not precedent in the Southern District of New York and to distinguish its decision as an exercise of independent judgment in light of different facts and different time periods. Indeed, the court would have been perfectly free to do this, especially since it could have noted that the court in *C. M. Paula* (decided in 1973) was completely unaware of how technology has made copyright infringement so easy and pervasive. For this reason, the court's decision

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[51] *See* 17 U.S.C. § 101 (defining the word "copy" as the material object "in which a work is fixed . . . and from which the work can be perceived, reproduced, or otherwise communicated" and the word "phonorecord" as the analogous term to "copy" where "sounds" replace "work").

[52] *See* 17 U.S.C. § 101 ("'Copies' are material objects . . . in which a work is fixed . . . ."). So copyrighted works are fixed or embodied in material objects, colloquially known as copies.

[53] *C. M. Paula*, 355 F. Supp. at 190.

could also be understood as a response to the ease and increase in copyright infringement resulting from technological advances.

B. File Sharing Zeitgeist

A palpable undercurrent of paranoia regarding illegal file sharing runs throughout the *ReDigi* decision, despite no explicit policy argument alluding to the practice. For example, the court explicitly relies on previous cases concerning peer-to-peer file sharing systems to provide analytical guidance. Specifically, the court uses *London-Sire Records, Inc. v. Doe 1* for the proposition that an electronic download of a music file is a reproduction of the sound recording when magnetically encoded on the downloader's hard drive as a phonorecord.[54] But *London-Sire* involved anonymous users of peer-to-peer file sharing software that were copying files from other users' computers. In each instance, a copy of the file simultaneously existed on the downloader's computer, while the original was retained by the supplier. That court stated, "[plaintiffs] note, correctly, that an electronic download does not divest the sending computer of its file . . . ."[55] It continued, "because the data at point A[, the source,] is not necessarily destroyed by the process of reading it, the person at point A might retain ownership over the original . . . ."[56] Thus, the facts on which the *London-Sire* court based its understanding of the reproduction and distribution rights differ substantially from the facts in *ReDigi*. Whereas the alleged infringers in *London-Sire* retained a copy of the music file that was "not necessarily destroyed," in *ReDigi*, the original file *is* necessarily moved from source to destination without retention, as designed and implemented by ReDigi's Media Manager software.[57]

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[54] "[W]hen a user on a [P2P] network downloads a song from another user, he receives into his computer a digital sequence representing the sound recording. That sequence is magnetically encoded on a segment of his hard disk (or likewise written on other media). With the right hardware and software, the downloader can use the magnetic sequence to reproduce the sound recording. The electronic file (or, perhaps more accurately, the appropriate segment of the hard disk) is therefore a 'phonorecord' within the meaning of the statute." *ReDigi*, 934 F. Supp. 2d at 649 (quoting London-Sire Records, Inc. v. Doe 1, 542 F. Supp. 2d 153, 171 (D. Mass 2008)).

[55] *London-Sire*, 542 F. Supp. 2d at 172.

[56] *Id.*

[57] *See ReDigi*, 934 F. Supp. 2d at 646 ("[A]t the end of the process, the digital music file is located in the Cloud Locker and not on the user's computer."); *see also* Def.'s Statement of Undisputed Facts Pursuant to Local Rule 56.1 ¶ 12, July 20, 2012, ECF No. 56 ("Once a user requests to place a legally acquired phonorecord in the Cloud Locker, the file is migrated to the Cloud Locker so that it is no longer on the user's local device.").

However, the court ignored this fairly significant difference. Instead, it extrapolated from *London-Sire* the belief that the "distinction is immaterial under the plain language of the Copyright Act. Simply put, it is the creation of a *new* material object and not an *additional* material object that defines the reproduction right."[58] The only additional form of support for its opinion is a reference to the dictionary definition of "reproduction," which means, *inter alia*, "to produce again" and not, as the court says, "to produce again while the original exists."[59] While the court makes a well-founded point, it is generally difficult to know whether an object has been reproduced unless the original (i.e., source) still exists.[60]

Fortunately, we have more evidence to resolve the specific facts in this case. The Media Manager software holds the key to whether the original was reproduced or simply moved. Unfortunately, all of the technical code is protected as a trade secret.[61] Nevertheless, the technical aspects of file storage and transfer will be analyzed in Section IV, which will shed light on how files are fixed on hard drives and alleviate concerns of rampant file sharing abuse.

Before analyzing the technical details of file storage and transfer, it is important to recognize that the court was in a difficult situation. *ReDigi* presented a novel question that had never been litigated before,[62] and there was limited legal doctrine to apply to the facts of this case. So it is perhaps natural that the morally opprobrious shadow illegal file sharing casts would also influence the court. It may have been tough for the court to conceptualize ReDigi's process when, traditionally, technology has made it easier to copy files for redundancy, archival,

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[58] *ReDigi*, 934 F. Supp. 2d at 650.

[59] *Id.*

[60] For example, if your friend gives you a fruitcake as a gift and you find it so fantastic that you exactly replicate it as a return gift for your friend, it is difficult for your friend to know whether you have exactly reproduced the fruitcake or sheepishly re-gifted the one your friend gave you. If you can produce the original fruitcake (or at least parts of it), you can probably salvage your relationship since your friend will know you didn't re-gift. If you can't produce the original fruitcake, your friend will have to take your word for it but will not know for sure whether it is a reproduction or the original.

[61] This is not surprising given how profitable the software can be if it is ultimately deemed legal. ReDigi CEO, John Ossenmacher, has already admitted that they are in talks with several interested companies to license their software. "There aren't many ways to do this without copying — we know, and they know, they'd be using our technology to do it." Peckham, *supra* note 11.

[62] *ReDigi*, 934 F. Supp. 2d at 648 ("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.").

and distribution purposes, sometimes illegally. Not that the situation cannot be conceptualized; without the potential to resell files, ReDigi subscribers are simply migrating their files to the trashcan for deletion. Obviously, this is absurd.

In a way, the court may be thinking that it is being hoodwinked; that ReDigi, with a wink and a nod, is telling the world that it is moving the file when in reality it is copying. With these reservations, it is difficult to intuit that ReDigi is more like eBay than it is like the original Napster.[63] By exploring the technical side of file storage and transfer, the distinction becomes more palatable.

III
STORING DIGITAL FILES ON A HARD DRIVE IS FIXATION CAPABLE OF BEING MOVED WITHOUT BEING REPRODUCED

Throughout its briefing of the case, ReDigi stressed the importance of understanding its technology to understanding its defense that it was not reproducing digital music files. Even while dealing with the sort of generalities inherent in analyses of proprietary processes, an argument can still be made that ReDigi is not infringing the copyright owner's reproduction right without knowing the details of the software.

A. Fixation of Sounds in Physical Structures

Before the advent of the Internet, and certainly before anyone had heard of an "MP3" file or compact disc, music was (and still is) recorded on vinyl records. Records are made by physically pressing grooves into a vinyl disc. As seen in Figure 1a, a record player's needle follows grooves in a disc as the disc spins. The needle moves within the grooves in accordance with their vertical and lateral undulations. That mechanical movement is then converted into electronic signals by electronic circuitry. These signals are ultimately amplified and then converted back into mechanical movements by the speaker, which produces sound waves that travel to the human ear.[64]

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[63] It is certainly possible for subscribers to game the ReDigi system. Dubious subscribers could create an external copy of their music prior to downloading Media Manager, which would not flag those copies since the software is unaware of prior events. However, this activity would be occurring despite Media Manager, not in concert with it. Furthermore, those subscribers would also likely realize that there are other easier methods to obtain digital files without using a scrupulous system like ReDigi.

[64] 9 MARSHALL CAVENDISH CORPORATION, HOW IT WORKS: SCIENCE AND TECHNOLOGY 1284 (Wendy Horobin et al. eds., 3d ed. 2003).

Although sound quality improved drastically with compact disc (CD) technology, the process of storing information on CDs remained very similar to that used with vinyl discs. On CDs, audio waveforms from vocals and musical instruments are converted into binary digits through a process of sampling (or digitizing) the waveform at intervals known as the sampling period.[65] Each sample of the audio waveform creates a series of binary digits based on the waveforms' amplitudes.[66] Instead of stamping grooves into vinyl, CDs are stamped with pits to differentiate between a "1" bit and a "0" bit of the digitized sequence.[67] Figure 1b shows those pits as viewed from the topside of the stamped layer.[68] A polycarbonate plastic encasing surrounds the CDs stamped layer for protection.[69] As the disc spins, a laser (rather than a needle) changes its radial distance from the center of the disc to read the particular physical changes in the CD.[70] When the laser hits a flat part of the CD, it reflects directly into a detector.[71] When the laser hits a pit, it scatters, reducing the intensity of the beam at the detector.[72] The difference in the detected intensity stemming from the physical changes of the CD creates the bit pattern read by the CD drive.[73] Because there is no conversion from mechanical movement to electronic signals, the noise levels are reduced and the sound quality remains clear.

Apparent from this description of vinyl records and CDs is the fact that the sound recordings are physically sculpted into such phonorecords. Understood in this manner, the fixation that occurs in vinyl records and CDs epitomizes the

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[65] JOHN Y. HSU, COMPUTER ARCHITECTURE: SOFTWARE ASPECTS, CODING, AND HARDWARE 3 (2001); *see also* SCOTT MUELLER, UPGRADING AND REPAIRING PCS 525–26 (20th ed. 2011).

[66] HSU, *supra* note 65, at 3.

[67] It is actually the detected transition from flat part to pit or pit to flat part that determines whether a "1" bit is read. When no transition is encountered over a threshold period, a "0" bit is read. CDs that are burned instead of stamped (e.g., by personal CD burners) differentiate between "1" bits and "0" bits by changes in the reflectivity of the recording material. The laser in the CD burner literally heats up portions of the writeable CD's recording layer, which creates the differentiating reflectivities necessary to create bit patterns. MUELLER, *supra* note 65, at 521, 532.

[68] Since the laser and detector are aimed at the underside of the CD, the plateaus are actually seen as pits from the laser's perspective.

[69] *Id.* at 520.

[70] *Id.* at 521–22.

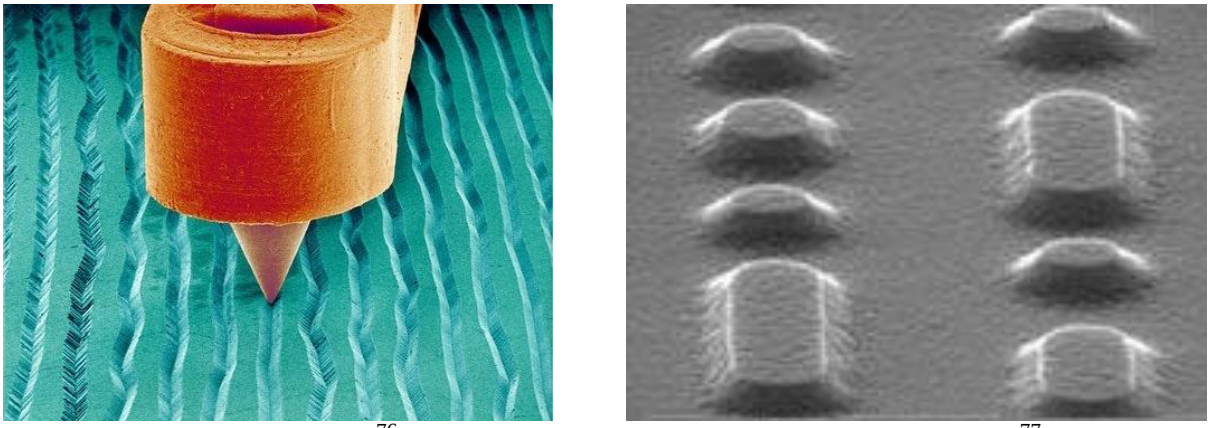
[71] *Id.*

[72] *Id.*

[73] *Id.* at 521.

prototypical fixation of phonorecords contemplated by the House of Representatives when they passed the Copyright Act.[74]

This conception of fixation also helps to explain the court's adherence to the proposition that "it is the creation of a *new* material object and not an *additional* material object that defines the reproduction right."[75] Because grooves and pits are physically sculpted as material objects into the recording layer of the disc, any *new* material object fixed with the same sound recording will necessarily be an *additional* material object. That is, the material fixation of the embedded sculpture is intimately tied to the recording layer. In this scenario, it is impossible to imagine moving the material object (i.e., the grooves or pits as a collection) without moving the recording layer of the vinyl disc or the CD as well. However, the notion of fixation changes when vinyl discs and CDs are replaced by hard drives composed of electric and magnetic fields.



(a) Vinyl Record[76] (b) Compact Disc[77]

Figure 1: Magnified images of vinyl record and CD surfaces

[74] H.R. REP. NO. 94-1476, at 56 (1976) (defining phonorecords as "physical objects in which sounds are fixed").

[75] *ReDigi*, 934 F. Supp. 2d at 650.

[76] Susumu Nishinaga, *Needle Playing a Record* (scanning electron microscope image), SCIENCE PHOTO LIBRARY, http://www.sciencephoto.com/media/215623/view.

[77] CD Scanning Electron Microscope Image, LPD LAB SERVICES, http://www.lpdlabservices.co.uk/analytical_techniques/sem.

B. Fixation of Sounds in Transferable Material Objects

When a ReDigi subscriber uploads his iTunes music from his personal computer to ReDigi's cloud service, he moves that music from a magnetic hard drive or solid-state drive to another magnetic hard drive or solid-state drive, both of which could be used as the actual storage mechanism of the server. But magnetic hard drives and solid-state drives are fundamentally different than vinyl records and CDs in how information is stored. Whereas it makes sense to describe information as fixed grooves and pits in a vinyl record or CD, that description is inapposite when describing information storage in magnetic hard drives and solid-state drives. This is because information is stored as electrical and magnetic signals (i.e., fields), which can actually be moved from one drive to another via electromagnetic waves and electrical lines that compose the current infrastructure of the Internet.[78] So although an electromagnetic representation of grooves and pits can be transferred over the Internet, the actual grooves and pits cannot be transferred over the Internet.[79]

Figure 2a shows a schematic drawing of a magnetic hard drive, specifically a single hard drive platter that stores digital information. Magnetic hard drives typically contain multiple, stacked platters, which are rigid, circular discs made from aluminum or glass.[80] Platters are divided into circular tracks, which can be further subdivided into sectors. Each sector contains a fixed number of storage layer domains, which are the physical implementations of data bits (0s or 1s).[81] When writing data, the write head element passes over the domains and impresses magnetic fields into the domains. During impression, the write head element creates a strong magnetic field at its tip (represented by the red arrows) to align the magnetic material in that domain in the same direction. The magnetic field is stored in one of two directions (represented by the black arrows).[82]

In order to read the data, the read head element passes over the domains. Instead of impressing the magnetic field like the write head element, it detects the direction of the magnetic field in each domain. If the magnetic field is constant from one domain to the next, no electrical signal is induced in the read head element, which interprets the data as a 0 bit. If the magnetic field changes from

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[78] JOHN RHOTON, THE WIRELESS INTERNET EXPLAINED 5–6, 10–11, 22 (2002).

[79] Therefore, any digital creation of a physical fixation that was transferred only with the help of the Internet, like that in vinyl discs and CDs, will necessarily involve a new fixation of the information since the original fixation could not have been transferred.

[80] MUELLER, *supra* note 65, at 445.

[81] *Id.* at 438–40.

[82] *Id.* at 422–24.

one domain to the next, an electrical signal is induced in the read head element, which interprets the data as a 1 bit.[83]

ReDigi's servers likely contain magnetic hard drives to store the iTunes music files because of their massive storage capabilities. Many of ReDigi's subscribers likely have magnetic hard drives in their personal computers as well. However, due to their rapidly decreasing prices, non-moving parts, and superior read and write speeds,[84] some ReDigi servers and ReDigi subscribers may have solid-state drives. Despite the differences between magnetic and solid-state drives, data in each is typically stored in a binary fashion.

Figure 2b shows a schematic drawing of a simplified solid-state hard drive. The drawing shows a memory unit capable of storing 32 bits of information. One bit of information is stored in each of the transistors, which are arranged into eight rows and four columns. Each bit is chosen for storing information by applying appropriate voltages to its corresponding word line and bit line.[85] The right side of Figure 2b shows an enlarged diagram of the transistor corresponding to word line six and bit line three. The transistor is composed of a silicon base and two other silicon layers (the gates) separated by two insulating layers (blue layers). Each transistor operates in two states: an "on" state (1 bit), and an "off" state (0 bit). The "off" state is programmed by applying a positive voltage to the control gate to attract a negative electrical charge (in the form of numerous electrons) into the floating gate. The transistor is erased to the "on" state when the electrical charge is removed from the floating gate by applying a negative potential to the control gate.[86]

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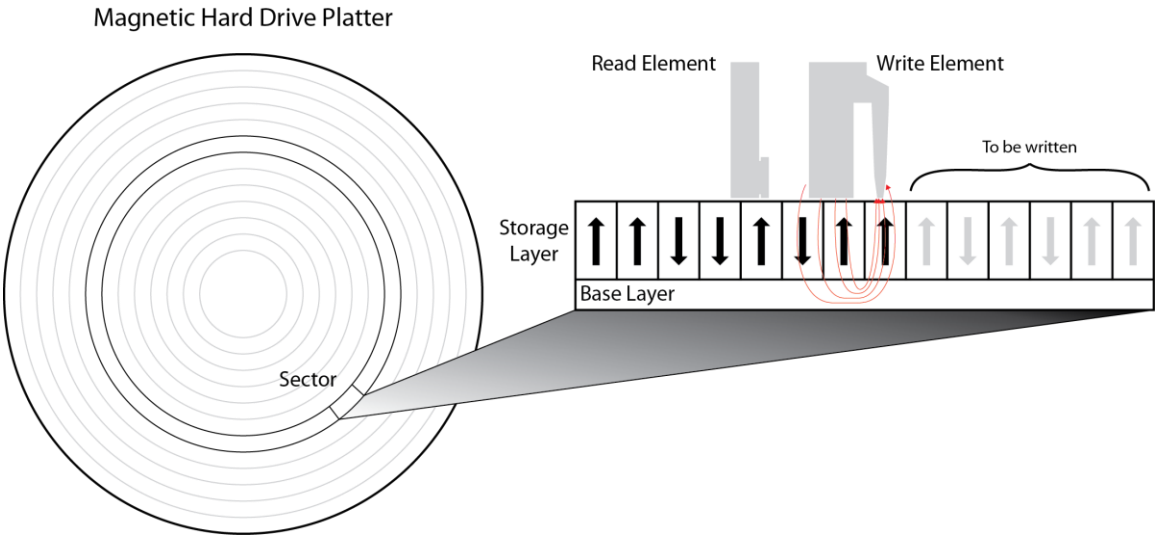
[83] This simple encoding mechanism, where no magnetic field change equals a "0" bit and a magnetic field change equals a "1" bit, is no longer used in practice because more advanced encoding techniques are available to increase storage capacity. *Id.* at 432–37.

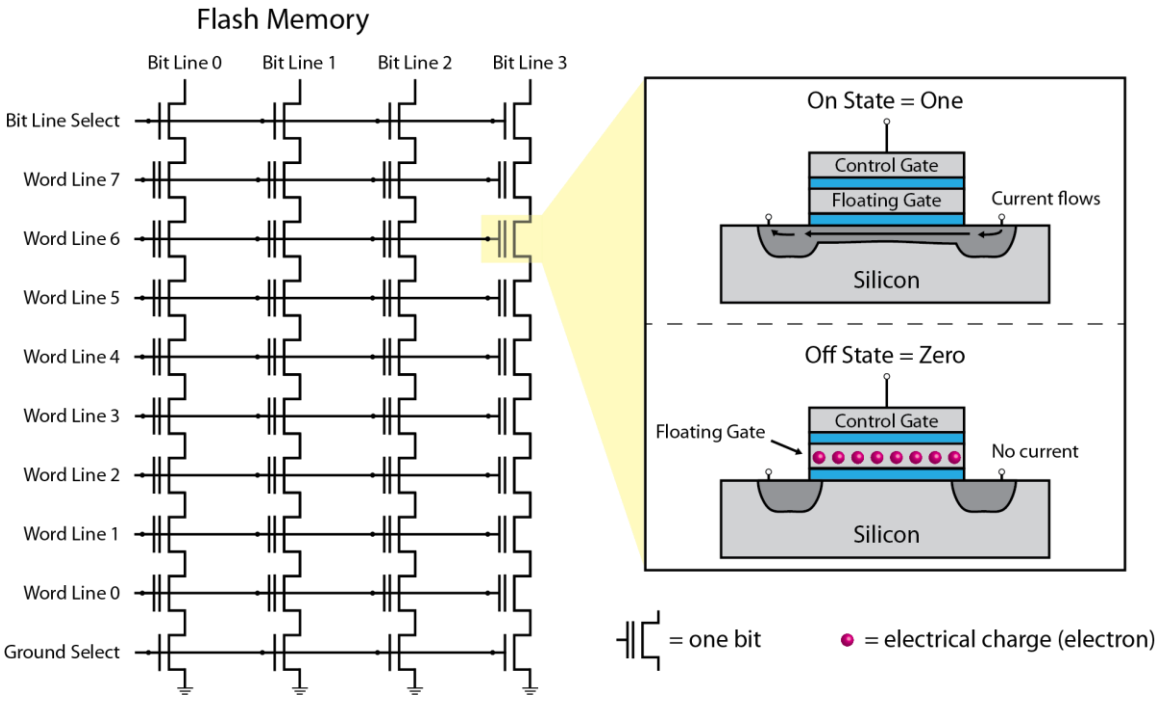
[84] *Id.* at 501.

[85] The bit line selects a certain column in the cell array and the word line selects a certain row in the cell array. All unselected cells in the series bit line are driven into a conducting mode. Thus, if the entire bit line conducts, the selected cell is "on" (conducting state), whereas if the bit line does not conduct, the selected cell is "off" (non-conducting state). RINO MICHELONI ET AL., INSIDE NAND FLASH MEMORIES 20–24 (Rino Micheloni et al. eds., 2010).

[86] GIULIO G. MAROTTA ET AL., NONVOLATILE MEMORY TECHNOLOGIES WITH EMPHASIS ON FLASH 64 (Joe E. Brewer & Manzur Gill eds., 2008).



(a) Magnetic Hard Drive



(b) Solid State Drive

Figure 2: Diagrams of fundamental storage devices for digital media

The electrical charge stored in the floating gate directly effects whether current will flow through the silicon base layer. In order to read the data stored in the transistor, the current is measured. If current flow is detected, a 1 bit is read. If current flow is not detected, a 0 bit is read.[87]

Although it is tempting to define these electrical charges and magnetic fields as fixed (in the legal copyright sense) in the drive, they are perhaps better described as *contained* or *stored* at a waypoint. This is because they are not intimately tied to the recording layer like grooves and pits, but instead are merely stored in an electronic transistor or a magnetic domain until they are transferred to a new storage unit.[88] Furthermore, because grooves and pits are physically fixed in the recording layer, they cannot be extracted and transferred in media that carry only electrical and magnetic signals.

The key point of this analysis is that when digital files are transferred from magnetic hard drives and, certainly, solid-state drives, no new material object is created because the electrical charge and magnetic fields that constitute the data are *actually transferred* from waypoint to waypoint. A more insightful way to conceptualize such data storage is to view the electrical charge and magnetic fields as material objects themselves, rather than assigning that role to the magnetic storage layer or transistor. In this schemata, every time data is transferred, the material object is transferred, which further implies that no *new* material object is created. This conceptualization posits that, upon transfer, the electrical charge or magnetic field is released from the waypoint; otherwise, the data would necessarily be copied into a new material object. And, just as the foregoing analysis indicated that electrical charge is easily stored and removed from the floating gate, magnetic fields can be stored and removed from their domains. While it may be unlikely that the exact material object in the legal sense (electron/magnetic field) is transferred from one waypoint to another, one cannot definitively say they are *not* transferred because they all appear identical to human observers.[89] This shows

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[87] *Id.*

[88] *See, e.g.*, CHRISTOPH FRIEDERICH, INSIDE NAND FLASH MEMORIES 67, 77 (Rino Micheloni et al. eds., 2010) (explaining how a programming operation injects electrons into the floating gate of a transistor cell and how an erase operation removes electrons from the floating gate of a transistor cell).

[89] DAVID J. GRIFFITHS, INTRODUCTION TO QUANTUM MECHANICS 179 (1995) ("The fact is, all electrons are *utterly identical*, in a way that no two classical objects can ever be. It is not merely that *we* don't happen to know which electron is which; *God* doesn't know which is which, because there is *no such thing* as 'this' electron, or 'that' electron; all we can legitimately speak about is 'an' electron."). In fact, John Wheeler, a well-renowned American physicist, actually postulated that there is only one electron and that all electrons are simply manifestations at a

how digital files can be differentiated from physical grooves and pits, since it is never possible for a physical, sculpture-like material object to be transferred along a medium conducive to electromagnetic signals.

Perhaps an analogy would help solidify the concept. Consider a series of five buckets at point A, of which the first three contain water and the last two do not. The five buckets at point A can be imagined to represent five bits in a "11100" sequence. One way to transfer that information is to carry the five buckets, with their contents, to point B. However, if the only way to transfer the bit sequence from point A to point B is copper tubing, carrying the buckets is no longer feasible. Nonetheless, the information can still be transferred to point B using the copper tubing, a prearranged timing protocol to know when to expect the water (if there is any) from each bucket, and five receiving buckets available at point B. Only the water, not the buckets, is essential to the communication because the water, not the bucket, is indicative of the bit sequence.[90] The water (electric charges and fields) is the material object in which the information (sound recording) is fixed, while the bucket (magnetic hard drive or solid state drive) is simply a storage container. When discussing vinyl records and CDs, however, there is no water. The shape of the bucket is the data-carrying object in this alternate universe. Although the user at point A could send color-coded water through the copper tubing to signify whether the bucket shape is, for example, cylindrical or rectangular, if the person at point B uses that information to create cylindrical and rectangular buckets of their own, we know they must be new material objects because the buckets cannot physically pass through the copper tubing.

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particular slice in time of the world line of that singular electron. Richard P. Feynman, Nobel Lecture: The Development of the Space-Time View of Quantum Electrodynamics (Dec. 11, 1965), *in* Nobel Lectures, Physics 1963-1970, at 155, 163 (1972), *available at* http://www.nobelprize.org/nobel_prizes/physics/laureates/1965/feynman-lecture.html ("I received a telephone call one day at the graduate college at Princeton from Professor Wheeler, in which he said, 'Feynman, I know why all electrons have the same charge and the same mass' 'Why?' 'Because, they are all the same electron!'"). Magnetic fields are invisible forces. So a similar conclusion can be reached knowing that magnetic fields generated by flowing electrons are indistinguishable from those generated by materials composed of magnetic domains. NEVILLE G. WARREN, EXCEL PRELIMINARY PHYSICS 74 (2004).

[90] One could just as easily imagine having a protocol where the person at point A pours whatever water is contained in a bucket into the copper tubing every minute. In that case, the user at point B only needs to stand under the copper tubing and determine which minutes of the five he or she gets wet to receive the communication.

It is this conceptual difference the court was unwilling to recognize in its *ReDigi* opinion. Instead of discussing the physics of storing digital information in magnetic and solid-state drives, the court chose to make a conclusory declaration that "[i]t is simply impossible that the same 'material object' can be transferred over the Internet."[91] Axiomatically, the court stated, "[t]his understanding is, of course, confirmed by the laws of physics."[92] However, if courts are going to premise infringement of reproduction rights on the creation of a new material object, it is critical that they recognize what fits that category. With today's modern technology, the line differentiating material objects from containers storing such objects has become clearer. Though the two are essentially indistinguishable with vinyl records and CDs, they can be conceptually separated in modern mass storage devices.

IV
DISTRIBUTION RIGHT PERTAINING TO PREVIOUSLY OWNED DIGITAL MEDIA

Even if ReDigi did not infringe the copyright owner's reproduction right, the company openly admitted to distributing the iTunes music files from its website.[93] Without a proper defense, this constitutes direct infringement of the copyright owner's distribution right under 17 U.S.C. § 106(3). Accordingly, ReDigi asserted the first sale defense, which entitles "the owner of a particular copy or phonorecord lawfully made under this title, . . . without the authority of the copyright owner, to sell or otherwise dispose of the possession of that copy or phonorecord."[94] However, the court rebuffed ReDigi's attempt to use the first sale defense because "as an unlawful *reproduction*, a digital music file sold on ReDigi is not 'lawfully made under this title.'"[95] Obviously, this conclusion is dependent upon the court's finding that the phonorecord uploaded to the ReDigi server is a *new* reproduction of a phonorecord. And because the court believes it is "impossible for the user to sell her 'particular' phonorecord on ReDigi, the first sale statute cannot provide a defense."[96]

But, as the previous section on reproduction rights attests, the court likely cannot—and does not even attempt to—substantiate its statement that it is impossible for a subscriber's particular digital phonorecord to be transferred to the ReDigi server. This is because the media used to send electromagnetic signals

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[91] *ReDigi*, 934 F. Supp. 2d at 649.
[92] *Id.*
[93] *Id.* at 651.
[94] 17 U.S.C. § 109.
[95] *ReDigi*, 934 F. Supp. 2d at 655 (quoting 17 U.S.C § 109(a)) (emphasis added).
[96] *Id.*

across the Internet do not transfer the sculpted grooves of vinyl records or pits of CDs, but rather transfer the electrical charge and magnetic fields that are the stored material of today's digital files. Thus, the court's conclusion that "[t]he first sale defense does not cover [transferring digital files] any more than it covered the sale of cassette recordings of vinyl records in a bygone era" is inappropriate in this context.[97]

As techniques and technology improve to more simply and efficiently transfer data, analogies to anachronistic practices become obsolete as well. A cassette recording of a vinyl record necessarily entails two phonorecords. Regardless of whether the cassette tape or vinyl record was made first, the fact that *another* phonorecord was produced implies that a *new* phonorecord was produced. Because the *new* phonorecord (i.e., the cassette recording in the court's analogy) is unlawfully reproduced, the first sale defense is inapplicable. In contrast, material objects that store digital phonorecords (e.g., electrons) are completely transferrable and thus no *new* material object need be created.[98] Once one recognizes that a *new* phonorecord is not necessarily being created, the conclusion that the first sale defense is inapplicable to ReDigi is called into question.[99]

V
POLICY CONSIDERATIONS

Despite ReDigi's lack of success in the Southern District of New York, one piece of good news for consumers is that, in the same opinion, the court declared moving digital files around one's computer for personal reasons, like defragmentation or transferring digital files from an old computer to a new computer, did not constitute an illegal reproduction of those files.[100] Unlike ReDigi's service, which "creates a new material object," the court claims that "relocating files between directories and defragmenting" (which also creates a new material object under the court's interpretation of a reproduction) are "almost

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[97] *Id.*

[98] *See infra* note 129 and accompanying text.

[99] This conclusion requires that the digital music phonorecord be transferred and, by implication, not retained by the transferor. Aaron Perzanowski and Jason Schultz advocate for a similar position but under the common law exhaustion principle on a policy basis rather than the first sale statute on physics principles. They say that if the original owner transfers his or her ownership interest in the file and the owner did not retain any copy of the file after transfer, the file should be sanctioned by the exhaustion principle. Without this policy change, the current law on copyright practically prevents the owner from alienating his or her digital music at all. Aaron Perzanowski & Jason Schultz, *Digital Exhaustion*, 58 UCLA L. REV. 889, 938 (2011).

[100] *ReDigi*, 934 F. Supp. 2d at 651 ("As Capitol has conceded, such reproduction is almost certainly protected under other doctrines or defenses, and is not relevant to the instant motion.").

certainly protected under other doctrines or defenses."[101] However, it does not state upon which legal doctrine this declaration is premised. In fact, upon further review, it is not clear whether these personal file reorganization actions would qualify as either fair use or *de minimis*, the two most germane defenses.

A. Less Law, More Feel?

> Fair use depends on
>
> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work.[102]

For these illustrative file reorganization actions, the second and third factors certainly weigh against granting the actions a fair use defense because digital media is commercial in nature and the entire work is reproduced. Factor one is less definitive. While the actions are not for profit, they are not educational either. Nor do they qualify under any of the specifically mentioned fair use purposes of "criticism, comment, news reporting, teaching . . . scholarship, or research . . . ."[103] The otherwise helpful transformative use inquiry[104] fails to provide guidance here, since file equivalency is desired. Factor four is also less definitive, but the fact that a copyright holder's revenue would increase if consumers were required to repurchase music that moved from one directory to another, or from one computer to another, suggests that the statutory text would weigh against these actions.[105] So, even though the first and fourth factors (which tend to predict the outcome of

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[101] *Id.*

[102] 17 U.S.C. § 107.

[103] *Id.*

[104] Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 579 (1994).

[105] *See* Am. Geophysical Union v. Texaco Inc., 60 F.3d 913, 931 (2d Cir. 1994) (concluding that the fourth factor favored the copyright holder because photocopying academic articles in a commercial business decreased potential licensing and subscription revenue that the business would have had to pay when it wanted to access the articles if they had not been photocopied). Contrarily, the Court might determine that the fourth factor favors time-shifting actions by viewing these activities as "caus[ing] . . . nonminimal harm to the potential market for . . . copyrighted works." Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 456 (2012). However, this contrary position may be attributed to default bias in that there is a long-standing tradition to look past these actions instead of challenging them.

the fair use defense more than the second and third factors)[106] don't definitively weight against fair use, it is no stretch of the imagination to believe that such actions may not "almost certainly [be] protected under [fair use]."[107]

Even more fickle in outcome is the *de minimis* defense. While the court could rightfully declare that moving files between directories or while defragmenting are *de minimis* reproductions, it is not clear why moving files to the Cloud would not then also be *de minimis*. In any case, the *de minimis* defense is usually limited to minimal and insignificant copying or displaying[108], neither of which applies under these actions. The court in ReDigi may be relying more on Capitol's concession[109] than on any legal defense asserted by ReDigi, given its perfunctory dismissal of the irrational outcomes that its holding could produce for the average computer user reorganizing files.

So what is really happening here? The answer probably has more to do with a policy of common sense than it does with the law. We all, including judges and copyright holders themselves, organize digital media on our computers or transfer digital media to our new computers.[110] In both actions, one file remains accessible to the user while the original instance is forgotten. Few people would welcome the thought of an infringement lawsuit under these circumstances.

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[106] Barton Beebe, *An Empirical Study of U.S. Copyright Fair Use Opinions, 1978–2005*, 156 U. PA. L. REV. 549, 584–85 (2008) (discovering that factor four and one coincided with the outcome of the fair use defense in 83.8% and 81.5%, respectively, of the 297 opinions analyzed while factor two coincided with the outcome in only 50.2% of the opinions).

[107] *ReDigi*, 934 F. Supp. 2d at 651.

[108] *See, e.g.*, Newton v. Diamond, 388 F.3d 1189, 1196 (9th Cir. 2004) (holding that a three-note sequence from a jazz composition was a "simple, minimal, and insignificant" sampling, constituting *de minimis* use); Sandoval v. New Line Cinema Corp., 147 F.3d 215, 218 (2d Cir. 1998) (holding that copyrighted photographs shown in the movie *Seven* for 35.6 seconds was *de minimis* because the photographs were obscured, severely out of focus, and virtually unidentifiable). *But see* Ringgold v. Black Entm't Television, Inc., 126 F.3d 70, 77 (2d Cir. 1997) (holding that a copyrighted poster shown in a TV show for 26.75 seconds was not *de minimis* because the poster was clearly visible and recognizable with sufficient observable detail).

[109] The court noted that Capitol conceded defragmentation and file relocation were protected from copyright infringement. *See ReDigi*, 934 F. Supp. 2d at 651 ("As Capitol has conceded, such reproduction is almost certainly protected under other doctrines or defenses, and is not relevant to the instant motion.").

[110] As more files are stored remotely, i.e., stored in the "Cloud," moving and transferring digital media will become nearly irrelevant for individual consumers but a highly relevant legal issue for remote storage companies. Unlike individual consumers, these companies will have the bargaining power to secure these reproduction rights for themselves and for their users via contracts, avoiding uncertainties in the default copyright law rules.

The crux must be then the commercial nature of ReDigi's transactions. The court has to be worried that the copyright holder loses potential revenue that it could have earned if the different user had purchased the right to reproduce a new copy. But, since moving digital media from one location to another on one's personal computer or transferring files from an old computer to a new computer is also a reproduction, it would only seem consistent to be worried that the copyright holder is also losing potential revenue that it could have earned if the same user was required to purchase the right to reproduce a new copy when performing these personal file reorganization actions as well.

Coherently differentiating ReDigi's plight from the situations that raise no ire from the court is not an easy task. Perhaps the policy rationale that the court manifested is that, in very close calls, err on the side of the copyright holder.

B. Global Policy Divergence

If the United States is leaning one way on the digital resale issue, the European Union appears to be leaning the other way. In a factual scenario much like that in *ReDigi*, the European Union's Court of Justice (ECJ) held that a resold user license to computer software permitted the secondary market purchaser to download (read: "reproduce") computer software onto the purchaser's computer.[111] UsedSoft resold "used," unlimited period licenses to Oracle software that UsedSoft purchased from original users. The ECJ stated that the first sale of the computer software enabled the copyright holder to obtain appropriate remuneration for exhaustion of the distribution right to the computer software.[112] It acknowledged that the reproduction right was not exhausted by the first sale but noted that any reproduction necessary for the use of the computer program by a lawful user is authorized.[113] Such necessary reproduction would entail the secondary market producer to download another copy of the computer software. Moreover, the reproduction "may not be prohibited by contract."[114] However, the ECJ sensibly stated that the original user must make his or her own copy unusable at the time of resale or the original user would infringe the copyright holder's right of reproduction.[115]

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[111] Case C-128/11, UsedSoft GmbH v. Oracle Int'l Corp. (E.C.R. July 3, 2012), http://curia.europa.eu/juris/document/document.jsf?text=&docid=124564&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=278434.

[112] *Id.* ¶¶ 63, 89.

[113] *Id.* ¶ 85.

[114] *Id.* ¶ 76.

[115] *Id.* ¶ 78.

Although the *UsedSoft* decision was limited to computer software, it is not difficult to imagine its extension to digital media. If this occurs, there will be a divergence in how the Unites States and the European Union handle reselling digital content in the secondary market. While this could lead to different price points in the two jurisdictions, a more likely result is the proliferation of restrictive "terms of use" agreements. Since the unlimited period of the license was critical to the ECJ's judgment in *UsedSoft*, it is only a matter of time before all digital media purchases end on resell. If purchases are defined as licenses[116] rather than outright sales, they can be terminated due to certain unfavorable actions.

C. Economic Policy

The digital world seems to be moving to a license-based purgatory in order to maintain more control over copyrighted works. Licensed users are restricted from using the first sale doctrine as a defense to distributing the digital media and therefore every user is forced into licensing from the copyright owner. In theory, this seems like the optimal way to generate the most revenue. But a pre-owned digital media marketplace may actually provide a better way to free untapped revenue. First, if consumers are able to resell their digital music and obtain some resale value, they may be willing to pay more upfront. Second, consumers that in the past avoided purchasing digital music due to its inalienability may be willing to purchase instead of stream if it can be resold. Lastly, digital music cannot be resold until it is originally sold and consumed. Only when a critical mass of copies has infiltrated the market and original owners have no further use of their original copies will original sales decline because of resales. Since sales are heavily concentrated in the first few weeks[117], if not days, of release, one wouldn't be unreasonable in projecting that resales won't have as large an impact on overall sales as one might initially assume.

For example, Figure 3 shows Beyoncé's self-titled album sales tracked over approximately 16 weeks from its release date.[118] The numbers indicate that the

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[116] *See, e.g., iTunes Store – Terms and Conditions*, APPLE (Sept. 18, 2013), http://www.apple.com/legal/internet-services/itunes/us/terms.html ("The software products made available through the Mac App Store and App Store . . . are licensed, not sold, to you.").

[117] *See* Alan T. Sorensen, *Bestseller Lists and Product Variety*, 55 J. INDUS. ECON. 715, 724–25 (2007) (presenting data of 1,217 books off the *New York Times* bestseller list that indicated 73.8% hit a sales peak within their first four weeks on sale with a resulting exponential decay afterwards and noting that these sales patterns can be seen in other entertainment areas).

[118] *E.g.*, Silvio Petroluongo, *Beyonce Bound for No. 1 as Sales Soar Past 400,000*, BILLBOARD (Dec. 14, 2013, 8:28 PM), http://www.billboard.com/articles/columns/chart-beat/5839787/beyonce-bound-for-no-1-as-sales-soar-past-400000; Keith Caulfield, *'Beyonce' Sales Grow to 550k-Plus, Set for No. 1*, BILLBOARD (Dec. 15, 2013, 10:14 PM),

majority of sales took place within the first three days (basically over the weekend). Assuming that most of those original purchasers didn't get their fix of Beyoncé over the weekend, the stragglers will continue to have to purchase original versions. Determining what effect a secondary market would have on overall original purchasers would vary to a large degree on the connectedness and magnetism of the music. However, regardless of its magnetism, it instantaneously becomes more seductive to would-be stragglers who are worried about buyer's remorse because of the resale fallback opportunity. Theoretically, then, there could be more "weekend" purchasers than under the current, no resale model.

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http://www.billboard.com/articles/news/5839792/beyonce-sales-grow-to-550k-plus-set-for-no-1; *BEYONCÉ Shatters iTunes Store Records with 828,773 Albums Sold in Just Three Days*, APPLE (Dec. 16, 2013), http://www.apple.com/pr/library/2013/12/16BEYONC-Shatters-iTunes-Store-Records-With-Over-828-773-Albums-Sold-in-Just-Three-Days.html; Keith Caulfield, *Beyonce Spends Second Week at No. 1 on Billboard 200 Chart*, BILLBOARD (Dec. 26, 2013, 2:13 PM), http://www.billboard.com/articles/news/5847921/beyonce-spends-second-week-at-no-1-on-billboard-200-chart; Keith Caulfield, *Beyonce Leads for Third Week at No. 1 on Billboard 200 Chart*, BILLBOARD (Jan. 2, 2014, 12:54 PM), http://www.billboard.com/articles/news/5855135/beyonce-leads-for-third-week-at-no-1-on-billboard-200-chart; Danielle Harling, *Hip Hop Album Sales: Week Ending 3/30/2014*, HIPHOP DX (Apr. 2, 2014, 12:55 PM), http://www.hiphopdx.com/index/news/id.28149/title.hip-hop-album-sales-week-ending-3-30-2014; Andres Tardio, *Hip Hop Album Sales: Week Ending 04/06/2014*, HIPHOP DX (Apr. 9, 2014, 10:00 AM), http://www.hiphopdx.com/index/news/id.28225/title.hip-hop-album-sales-week-ending-04-06-2014. Although less established musicians may require a few weeks or months to create peak sales, those sales will still likely be made by original purchasers because the secondary supply will not meet consumer demand. In cases like these, the exponential decay will not begin immediately but instead follow the fast rise.

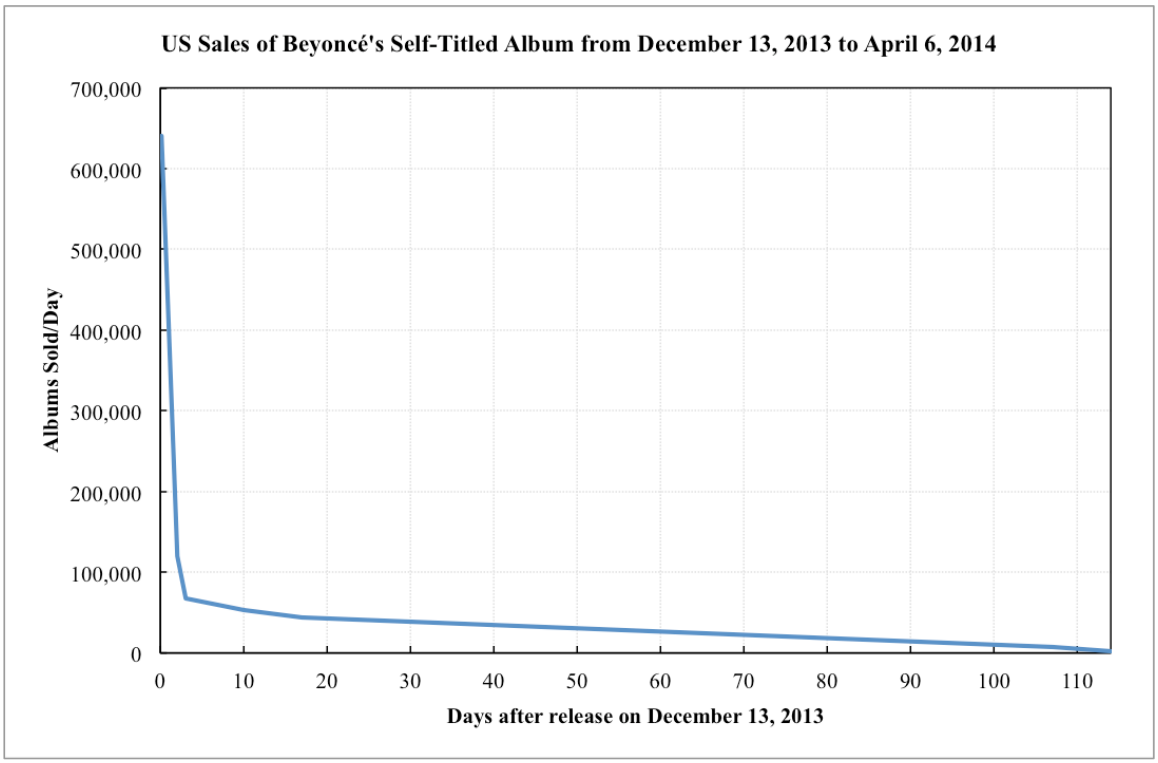

Figure 3: US Sales of Beyoncé's Self-Titled Album

There are certainly attendant economic risks associated with a secondary resale market. But as they aren't clearly irrational risks, it would be surprising if Capitol Records engaged in this sort of cost-benefit analysis before commencing litigation against *ReDigi* in an attempt to shut down the resale market. After all, the secondary market isn't a file sharing market (as used in its pejorative sense). And, as the ECJ prudently noted, reselling on the secondary market is authorized only on the condition that the original user render the original version unusable, assuring the copyright holder has seen revenue at some point from every copy in the market.[119] Much of the paper has focused on this same notion — that the original version (as a material object) is in fact made unusable because that original version (the material object itself) is transferred to the new consumer.

VI
FUTURE OUTLOOK OF PREVIOUSLY OWNED DIGITAL MEDIA

If patent activity is any indication of the future of used digital media, this will not be the last case courts confront on the issue of reproduction and

[119] *UsedSoft GmbH*, ¶ 78.

distribution of digital media. Amazon[120] and Microsoft[121] have already received patents on technology enabling secondary markets for digital media. Apple has applied for a patent[122] on its own method, and ReDigi has not given up on the business idea, filing a new patent application[123] on a system that completely avoids the unlawful reproduction issues addressed in its case against Capitol Records.

A. Possible Solutions

For those entities still looking to create a business around reselling used digital media, there are a few possible options available to continue that pursuit.

1. Legal Battle Option

The first option is to pursue the argument made above — that, contrary to the opinion of the Southern District of New York, ReDigi did not reproduce the digital media files on its servers. The advantage of resolving the complex issue this way is that it puts digital media files stored on magnetic and solid-state drives on a level playing field with digital media files stored on more physically mobile forms of storage, such as CDs, vinyl, and USB flash drives. Physical displacement of physically mobile storage devices from transferor to transferee is a well accepted means of transferring ownership without reproduction, and transferring digital media stored as electric charge and magnetic fields via electrical lines and electromagnetic waves should be a no less accepted means of transferring ownership without reproduction in the modern age of digital communication.

The disadvantage of proffering this argument is simple but paramount in practice — it is unlikely to win judicial support. While it embraces the intersection of science and law in an attempt to create a well-reasoned rule, the court, at least in the *ReDigi* case, seems ready to dismiss anything more than a cursory examination[124] of the scientific principles that guide how copyright law might be interpreted when applied to innovative, new technology.[125]

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[120] U.S. Patent No. 8,364,595 (filed May 5, 2009).

[121] U.S. Patent No. 7,818,811 (filed Dec. 6, 2005).

[122] U.S. Patent Appl. No. 13/531,280 (filed June 22, 2012).

[123] U.S. Patent Appl. No. 13/760,823 (filed Feb. 6, 2013).

[124] *See ReDigi*, 934 F. Supp. 2d at 649 (stating an ostensible maxim "confirmed by the laws of physics" that "[i]t is simply impossible [for] the same 'material object' [to be] transferred over the Internet").

[125] *See, e.g.*, 17 U.S.C. § 101 (defining a "digital transmission"); 17 U.S.C. § 117 (limiting certain exclusive rights for computer programs); Digital Millennium Copyright Act, Pub. L. No. 105–304, 112 Stat. 2860, 2873–74 (1998) (discussing limitations on liability for digital transmissions).

Furthermore, the argument laid out above that ReDigi effected only an object transfer, not creation, has several vulnerabilities. While it is true that electrons can move from point A to point B in a conductive wire, it is highly unlikely that all the electrons used to store the bits of the digital file on the ReDigi server were those used to store bits of the digital file on the subscriber's personal computer. This is because free electrons "hop" from ion to ion when traveling down a conductive wire.[126] Copper atoms, for example, that compose wires impede the movement of electrons as temperatures rise due to thermal vibrations, making it more challenging for a particular electron to reach point B as its distance from point A increases.[127] Similarly, although electromagnetic waves represent the fundamental underpinnings of wireless communication, electromagnetic waves are impeded by physical barriers and magnetic fields stray along wired communication lines and thus don't correlate exactly with the magnetic fields used to store the bits of the digital file.[128] These weaknesses only increase the resistance with which a court would meet any proposed scientific argument. Nonetheless, data stored at a subatomic scale is different from data stored on a macroscopic scale, like on paper or in a CD, precisely because subatomic particles and magnetic fields can be physically transferred, indeed are the transferring agents, along internet communication channels whereas macroscopic material objects cannot.[129] And even though an observer cannot definitively say that the same subatomic material objects originally fixing the copyrighted work were transferred to the recipient, a critic would actually fare worse because the critic would have to show how two identical particles (the original material object and accused, different, transferred material object) are actually different.[130] The boundary between material objects and the communication channels used to transport them is blurred to the point that the court can no longer rely on archaic analogies to times past when interpreting anachronistic laws.

However, even if a court were to accept the above argument, the copyright holder could still wield his distribution right to show infringement. This is because consumers who are considered licensees, as opposed to owners, with restricted transfer and use rights are unable to invoke the first sale doctrine to distribute

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[126] 1 SURINDER PAL BALI, ELECTRICAL TECHNOLOGY: ELECTRICAL FUNDAMENTALS 17–18 (2013).

[127] U. A. BAKSHI & V. U. BAKSHI, BASIC ELECTRICAL ENGINEERING 1-14 (2d ed. 2009).

[128] CURT WHITE, DATA COMMUNICATIONS AND COMPUTER NETWORKS: A BUSINESS USER'S APPROACH 78, 83, 104 (5th ed. 2009).

[129] BALI, *supra* note 126, at 17–18; WHITE, *supra* note 128, at 83.

[130] *See supra* note 89 and accompanying text.

digital media files without repercussions.[131] If the copyright holder or its authorized vendor (e.g., iTunes) licensed the use of digital media files via carefully constructed license agreements[132] (instead of selling them), a reselling licensee would still be a sitting duck for an infringement claim on the copyright holder's distribution right. Thus, any legal victory for a defendant under the reproduction right would likely be a mere consolation prize once infringement of the distribution right was adjudged.[133]

2. Technological Workaround Option

The second option is to pursue a solution outside of the legal system. Because the legal system can be slow to reverse course, using technology to work around the obstacles set up by the legal system can actually lead to faster and less costly solutions.[134] And, in fact, this is precisely what ReDigi did.[135] As discussed in ReDigi's patent application, the essence of the workaround takes the form of redirection software installed on the subscriber's computer. That software redirects downloaded packets (i.e., pieces) of the digital media file from the

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[131] Vernor v. Autodesk, Inc., 621 F.3d 1102, 1107, 1111 (9th Cir. 2010) (noting that "[t]he first sale doctrine does not apply to a person who possesses a copy of the copyrighted work without owning it, such as a licensee" and holding that a software user is a licensee rather than an owner when the copyright owner "(1) specifies that the user is granted a license; (2) significantly restricts the user's ability to transfer the software; and (3) imposes notable use restrictions").

[132] In a case similar to *Autodesk*, involving promotional CDs rather than computer software, the Ninth Circuit held that a boilerplate "promotional statement" affixed to the promotional CDs did not constitute a license agreement and therefore did not prevent transfer of ownership to the recipients. UMG Recordings, Inc. v. Augusto, 628 F.3d 1175, 1180 (9th Cir. 2011). Even though the "promotional statement" stated that the CD remained property of the record company and was only licensed to the recipient for personal use, because the promotional CDs were dispatched without prior arrangement with the recipients, the CDs were not numbered, and no attempt was made to keep track of them, the court held that no license agreement had been created. *Id.* at 1180–82.

[133] In the *ReDigi* case, ownership of the digital file was not contested. *See ReDigi*, 934 F. Supp. 2d at 645–46.

[134] Technological workarounds are frequently seen in the patent realm where the infringing party believes it easier and less costly to change software and hardware rather than pay a licensing fee. *E.g.*, *Facetime Workarounds of VirnetX Patents Bring Complaints, Costs*, MACNN (Aug. 30, 2013, 7:00 PM), http://www.macnn.com/articles/13/08/30/apple.allegedly.spending.24m.per.month.to.reroute.video.calls (stating that Apple was working on fixing problems to a workaround for a patent infringing FaceTime component, which had been costing Apple $2.4 million per month in royalty payments).

[135] Because the new technique was launched on June 11, 2012, after Capitol Records filed the complaint, it was not considered in the *ReDigi* case. *ReDigi*, 934 F. Supp. 2d at 646 n.3.

subscriber's personal computer to the subscriber's personal space on ReDigi's cloud storage servers.[136] Therefore, the subscriber's personal computer acts as another node of the Internet in which the packets simply pass through on their way to the ReDigi cloud storage server.[137] The downloaded digital file is stored for the first time on the ReDigi cloud storage server, not the subscriber's personal computer.[138] Because the file stored on the ReDigi cloud storage server is the original file downloaded from the online retailer (e.g., iTunes), there is no reproduction (and, of course, no unauthorized reproduction). Once the subscriber decides to sell the used digital content, ReDigi can simply update the owner of the allocated space occupied by the digital file on the server.[139] In other words, ReDigi can change the ownership permissions from transferor to transferee without actually moving the digital file around on its cloud storage server, thereby avoiding any further complications over unauthorized reproductions. The subscriber can still access the file by streaming its contents in a manner akin to services like Amazon Cloud Player, Google Play, and iTunes Match, whose services at this point have a favorable legal track record. This is due, in part, to similar remote television streaming services being held compliant with copyright law in the Second Circuit[140] and, in larger part, to the contractual agreements they have covering much of the music they stream.

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[136] '823 Patent Appl., *supra* note 123, ¶¶ 35-46.

[137] *Id.*

[138] *Id.*

[139] *Id.* ¶ 31.

[140] Cartoon Network LP v. CSC Holding, Inc., 536 F.3d 121, 139 (2d Cir. 2008) ("Because each RS-DVR playback transmission is made to a single subscriber using a single unique copy produced by that subscriber, we conclude that such transmissions are not performances 'to the public,' . . . ."); Am. Broad. Cos., Inc. v. Aereo, Inc., 874 F. Supp. 2d 373, 378 (S.D.N.Y. 2012), *aff'd sub nom.* WNET, Thirteen v. Aereo, Inc., 712 F.3d 676 (2d Cir. 2013) (finding that a streaming television service did not violate the copyright holder's public performance right because broadcasts captured by each user's uniquely assigned antenna were not shared with or accessible to other users). *But see* Fox Television Stations, Inc. v. FilmOn X LLC, 966 F. Supp. 2d 30, 47–48 (D.D.C. 2013) (reasoning that a streaming television service operating a unique mini-antenna for each user did infringe the plaintiff's public performance right because other devices in the transmission, like the tuner, server, router, and video encoder, were aggregated among all users in a public manner); Fox Television Stations, Inc. v. BarryDriller Content Sys., PLC, 915 F. Supp. 2d 1138, 1143–44 (C.D. Cal. 2012) (disagreeing with the Second Circuit's interpretation of 17 U.S.C. § 106(4), which grants an exclusive right "to perform the copyrighted work publicly," and coming to the conclusion that the seemingly private streams are in fact public).

While the technological workaround avoids any further liability to ReDigi from the *ReDigi* case itself, the legal ramifications of the opinion will continue to haunt future defendants in similar situations. If the court's holding remains unchallenged, it will continue to carry precedential value, potentially expanding copyright protection beyond a reasonable interpretation of the Copyright Act. ReDigi should not be expected to solely carry the burden of safeguarding the public's interest against copyright expansion, but it may be necessary to compete with bigger companies that can easily bargain their way to immunity. Nonetheless, since ReDigi does not have the bargaining power of giants like Amazon, Google, and Apple, it is also possible Capitol Records would still pursue legal action against ReDigi for infringing public performance rights until ReDigi paid for a licensing agreement.

3. Contractual Option

The first two options are really rivers that ultimately lead to the vast ocean of contractual agreements. By agreeing to a contract, both parties remove legal action from the realm of copyright infringement into the realm of contract law.[141] This eliminates a large degree of uncertainty and allows the parties to set their own terms for ownership of intellectual property without wondering how a court will interpret congressional action. The trend of relying on contracts instead of judges will only increase as these major players experiment with the secondary market for digital media.[142]

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[141] *London-Sire*, 542 F. Supp. 2d at 174.

[142] For instance, Google Music, a free streaming music service for users that have uploaded their collection to Google servers, initially launched in May 2011 without licensing agreements. Antony Bruno, *Why Record Labels and Google Music Couldn't Agree on the Cloud*, THE HOLLYWOOD REPORTER (May 12, 2011, 3:30 AM), http://www.hollywoodreporter.com/news/why-record-labels-google-music-187889; *Google Music Is Open for Business*, GOOGLE OFFICIAL BLOG (Nov. 16, 2011), http://googleblog.blogspot.com/2011/11/google-music-is-open-for-business.html. By November 2011, Google had come to terms with three major record labels, obviously concerned about possible record label backlash. Donald Melanson, *Google Partners with Universal, EMI, Sony Music, 23 Independent Labels on Google Music, Scores Exclusive Content*, ENGADGET (Nov. 16, 2011, 5:34 PM), http://www.engadget.com/2011/11/16/google-partners-with-universal-emi-sony-music-23-independent. Before that time, Apple had already secured agreements with the major record labels for their paid iTunes Match service, which allows users to stream music in their collection without actually uploading any files to Apple's servers. Aaron Gottlieb, *iCloud: The Devil Is in the Details*, MUSIC BUS J. (Aug. 2011), available at http://www.thembj.org/2011/08/icloud-the-devil-is-in-the-details. Amazon has also secured licensing agreements with the major record labels to add similar subscription-based scan and match capabilities to its Cloud Player as well. Press Release, *Updated Amazon Cloud Player Includes New Scan and Match Technology, Free Audio Quality Upgrades, and More*,

CONCLUSION

Capitol Records has two obvious concerns associated with ReDigi's business model. First, despite ReDigi's most thorough efforts, users can store files externally to their local computer in order to retain a copy for themselves prior to becoming a subscriber. Second, if users are purchasing previously owned music from other users, then they are not purchasing "new" music from providers that share profits with Capitol Records. While the first is a legitimate legal concern, it is a separate issue from whether ReDigi is committing or inducing copyright infringement, especially since ReDigi actively eliminates copies stored on the user's computer when the user sells the music. The second is a legitimate business concern but, again, separate from the issue of copyright infringement.

Technology will always be one step ahead of the glacially-moving legal system. Rather than attempt to rein in technology through legal maneuvering, copyright holders should try to incorporate it into their business models. With the uncertainty surrounding digital music transferring and copyright holders pressing the issue with almost nothing to lose, licensing agreements will continue to be sought after by both parties looking to mitigate potential loses.

Because court decisions loom large when determining which party has more leverage in contractual agreements, every court decision should be analyzed and scrutinized for flawed reasoning. These instances of flawed reasoning will be few and far between when *legal* reasoning is involved because judges have a vast amount of experience, and interpretation of the law is often subjective. However, most judges outside of the Federal Circuit have little experience with scientific reasoning, which can lead to incongruent holdings and confused parties. This is what happened in the *ReDigi* case. While ReDigi's technological acumen has allowed it to sidestep this problem for now, future entrants in the digital resale market may be less fortunate.

AMAZON.COM (July 31, 2012), http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-newsArticle&ID=1720456. And, as an attempt to quell music company fears, Microsoft has even touted that its offline reselling can benefit copyright holders of pirated content because of "its ability to 'register' such content back into media that generates revenue in the ecosystem." '811 Patent, *supra* note 121, col. 16 ls. 21–22.