Copyright and the Architecture of Digital Delivery

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Abstract:

Copyright law is largely a response to new media: from the printing press through radio, photocopiers, and digital computers, changes in copyright reflect the increased public availability of information reproduction technologies. But while the exclusive rights conferred by copyright are shaped by the technologies they respond to, the opposite is also true: technology is shaped in response to the requirements of copyright, altering or innovating designs to either avoid or accommodate the demands of the law. Nowhere has this dynamic interaction been more apparent than in the 2001 copyright decision against Napster and in the succeeding impact of that case. The *Napster* case and its progeny reveal a pattern of creative “inventing around” previous definitions of formal copyright boundaries. Such interactive re-imagining of technical and legal standards continues in current legal controversies regarding digital delivery systems such as streaming media, digital lockers, and “cloud” services, extending the pattern present in Napster and its progeny into current copyright policy.

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Introduction

On February 12, 2001, a panel of the United States Court of Appeals for the Ninth Circuit endorsed the previous decision of a lower court, holding that the operators of the Napster peer-to-peer file sharing network were presumptively responsible for copyright infringement conducted on its system (*A&M Records v. Napster*, 2001). The Ninth Circuit remanded the case for entry of a preliminary injunction requiring Napster to police the infringement on its system. Once Napster implemented measures to purge unauthorized file-sharing, it rapidly lost

subscribers, investors, and content, and eventually descended into bankruptcy. Napster's assets – primarily its distinctive logo – would be sold off and deployed in an entirely different type of authorized music venture (Logie, 2006), but the Ninth Circuit's decision was effectively the end of the system that launched the Internet file-sharing phenomenon.

Napster's demise was of course intended by its opponents not merely to remove a major source of unauthorized music reproduction, but to serve as a warning to the owners and potential investors of similar business ventures. Yet the Napster decision proved a largely pyrrhic victory in the protracted, losing rearguard action of legacy entertainment businesses against the rapid and pervasive spread of digital reproduction technologies (Giblin, 2011, pp. 178-79). Napster's popularity and prominence offered an easy target for a copyright infringement challenge, but its removal initiated a proliferation of equally unauthorized peer-to-peer services, with fewer and fewer clear targets for legal action.

The *Napster* decision also marked the emergence of a particular pattern of technological antiphony to the assertion of copyright, a phenomenon that has become increasingly pronounced in subsequent copyright cases. Most recently, it has been apparent in the video streaming case *American Broadcasting Companies v. Aereo* that was recently decided by the United States Supreme Court, in which the technology at issue is obviously and admittedly designed to skirt the formal definition of infringement announced previous copyright decisions. More than the specific doctrines and legal precedent provided by copyright file sharing cases, this technical response to legal declaration typifies the legacy of *Napster* and subsequent decisions on digital content delivery.

It is this pattern of technological response that I will explore here. In this article I focus will on the interplay between law and technical design as illustrated by *Napster* and subsequent U.S. copyright decisions. Although copyright varies somewhat between jurisdictions, I will focus here on the U.S. system in which the *Napster* case was adjudicated and within which Napster's influence can be most directly traced, realizing that the effects I explore will undoubtedly be seen in other copyright jurisdictions. I begin by sketching a few salient features of the U.S. copyright system, particularly the doctrines of secondary liability that were determinative in the *Napster* case and its progeny.

I then offer some policy analysis concerning this repeated phenomenon of “inventing around” copyright constraints, considering whether this phenomenon furthers any of the societal goals that are implemented in copyright law. I draw both from the literature regarding technical “code” as a behavioral constraint, and from parallel policy analyses in patent law where “inventing around” is a well analyzed phenomenon. As a separate but related form of intellectual property, patent law offers useful insights into the circumstances under which technology might be re-configured to avoid copyright. At the same time, copyright involves its own unique considerations, differing from patent both in the purpose of its exclusive rights and in the structure of the law that engenders such rights. I conclude with a discussion of such considerations and how they might figure into copyright policy going forward.

Classically, copyright was not intended to be directed toward technological discovery or progress. The core subject matter of copyright historically has been, and today remains, largely directed to aesthetic and artistic creations: literary works, dramatic works, choreography, musical compositions; pictorial, graphic and sculptural works. Certainly the format of such works has changed over time, moving from paper, clay, and canvas to celluloid, magnetic media, and other digital formats, but the aesthetic nature of the creative works fixed in such media has remained fairly constant (Litman, 2001). Additionally, the artistic genres enabled by new media formats have joined the more venerable subject matter of copyright: for example, audiovisual works and sound recordings are relative latecomers to the canon of copyright. But these, too, are artistic works that rely upon new technology for their instantiation, rather than constituting new technologies themselves.

If anything, copyright was classically intended as a *response* to technological discovery or progress. There is little reason for a legal regime to control copying when the material affordances of technology will naturally police themselves – if copying is time and labor-intensive, as would be the painstaking manual copying of texts in the medieval scriptorium, then the supply and price of copies is essentially self-regulating (Burk, 2010). Copies will be few, and their price will be high. As new technology such as the printing press lowers the cost and speed of copying, prices fall, availability rises, and natural copy control by means of physical impediments deteriorates, allowing the works to be more easily appropriated (Goldstein, 2003). Creators may be less likely to invest in new works that can be quickly and easily misappropriated, as there is no assurance they will be paid for works that can be acquired for free. However, legal exclusivity can replace some of the control that was lost due to more effective copying technology. As increasingly effective copying technology is developed and disseminated – offset lithography, xerography, digitization – legal exclusivity is called upon to fill a greater and greater gap between the initial cost of creation and the cost of subsequent dissemination (Depoorter, 2009).

Consequently, the suite of exclusive rights encompassed by copyright is structured toward providing the control and opportunity for remuneration that eroding material affordances no longer supply. These rights have changed and expanded over time, as the technology changes and as new creative forms enter the copyright subject matter canon. Copyright conveys the exclusive right of reproduction, the “copy-right,” that allows the owner to authorize or prevent copying of the protected work (17 U.S.C. § 106). But copyright carries with it a set of other, related rights, such as the right of distribution, which also allows the copyright owner to permit or prevent most sales, transfers, and conveyances of copies of the work. Copyright similarly entails the exclusive right to adapt or prepare derivative works, as well as the exclusive rights to publicly perform or publicly display a protected work. The scope and nomenclature for such rights varies a bit between jurisdictions; for example, many countries recognize a right of communication to the public which encompasses the American rights of public performance and display. But in general international efforts at harmonization have produced copyright law with recognizable similarities around the world.

While the subject matter of copyright is largely artistic rather than technical, the exclusive rights that attach to such creative works are frequently defined in technical terms. Such technological

parameters are in large measure the detritus of repeated legislative amendments, prompted by lobbying on the part of established copyright industries when new technologies emerge to instantiate and convey creative content. Such amendments divide rights and responsibilities among stakeholders, extend the exclusive rights granted by the statute, and sometimes create exceptions to or exemptions from existing exclusive rights (Litman, 2001). The amendments are typically couched in terms of the most contemporary technological threat to the hegemony of copyright holders. Radio, broadcast television, xerography, cable, digital transmission, and other communication technologies have all left their mark on the statute as Congress has responded to the demands of copyright holders, resulting in the cumulative amendment of the statute over time.

Secondary Copyright Liability

Technological design has also become a critical consideration in the assertion of certain exclusive rights accompanying copyright, which are incidental or ancillary to the rights enumerated in the statute. In common law jurisdictions such as the United States, such rights may be added by the inherent power of courts enforcing the statutory direction of the legislature. Particularly important to the saga of Napster and its progeny are doctrines imposing secondary liability on those who do not directly infringe any of the exclusive rights articulated in the copyright statute – such rights were dispositive to the Napster case itself, and to the its legacy of designing around copyright doctrines.

Courts developed secondary liability because it is quite possible for a clever miscreant to exploit the creativity of another by aiding and abetting copyright infringement – supplying financing for copying, perhaps, or advertising to sell unauthorized copies, or providing other enabling services that are not themselves infringement of the copyright. With the growth of mass-marketed computer and consumer electronics, the provision of personal copying technologies to a broad audience has become perhaps the most common scenario that might lead to such secondary liability. For example, in the case of Napster, it was clear that the owners and operators of the system were not themselves making infringing reproductions, or for that matter any reproductions at all. Neither were they distributing or publicly performing the works of copyright holders – if such activities were occurring, they were occurring at the instigation of Napster’s subscribers. The question then was whether Napster might be illicitly aiding such actions by providing its software and service, making the firm responsible in some fashion for the activities of its subscribers, even if no one at Napster was directly infringing copyright.

Such secondary liability for “aiding and abetting” copyright infringement has traditionally developed under two doctrines, and due to its technical structure, Napster was found liable under both of them. The first of these, vicarious liability, rests upon the ability of a business entity to supervise and potentially benefit from others who are directly infringing copyright. Drawing on a previous music piracy decision, *Fonovisa v. Cherry Auction*, (1996) in which the operator of a “swap meet” or flea market was held vicariously liable for the sale of infringing cassette tapes at booths within the swap meet, the court held Napster similarly liable for music traded on its virtual “territory” (Burk, 2003, pp 21-22).

In *Fonovisa* the court had held that the land owner had the ability to control who entered onto his land, and benefitted financially from the illegal sale of pirated tapes at the market. The land owner could have detected the infringing activity and expelled the pirates. The court reasoned by analogy that Napster constituted the cyberspace equivalent of a swap meet land owner: it controlled who logged onto and who traded music on its system. Napster's system included a centralized database of files available for sharing; thus like the land owner, Napster too, could have detected the infringing activity and expelled the infringing file sharers. Napster's financial benefit was somewhat more attenuated than the fees charged to enter the physical swap meet; the heightened activity on its system was used to attract investors, but the potential financial gain was deemed sufficient for vicarious liability.

An alternative but related basis for indirect liability in the Napster decision concerned the legal doctrine of contributory infringement, specifically, contributory liability for providing direct infringers with the technological means to infringe. The criteria for this type of liability were established by the United States Supreme Court in the celebrated "Betamax" decision, *Sony v. Universal Studios* (1984). The technology at issue in the *Sony* case was the home video recording and playback Betamax device; because the Betamax in combination with a television receiver could record television and movie broadcasts, copyright owners objected that the device would be used by consumers to make unauthorized copies of such broadcast audiovisual works, and that Sony should be liable for aiding such likely infringement. However, the Supreme Court reasoned that there should be no liability for providing consumers technology with substantial non-infringing uses, even if consumers perhaps would put the technology to infringing uses once it was available. In the particular instance of the *Sony* case, the Court reasoned that using the Betamax recording capability to "time-shift" broadcast transmissions to an alternate viewing time was a fair use, and in turn a substantial non-infringing use, thus relieving Sony of liability for providing the home video recording technology to consumers.

To avoid contributory infringement liability for supply millions of direct infringers with the technical means to do so, Napster attempted to portray itself as a technology having "substantial non-infringing uses" (Dogan, 2001). For this prong of the *Sony* test, the linchpin issue in the Napster context concerned whether the "substantiality" criterion was quantitative or qualitative: to avoid liability, did the number of non-infringing uses for the technology need to rise to a particular, substantive level, or could the number of non-infringing uses be small but still socially significant despite their comparative paucity? Clearly the vast majority of the material being traded on the Napster system constituted unauthorized digital files, primarily music, but also some software and video files. Some significantly smaller percentage of the files traded were on the contrary authorized: some musical composers and performers, for example, approved of file sharing as a method of increasing audience awareness, or were using the file sharing system in lieu of more traditional distribution channels. If substantiality were based on a quantitative measure, Napster was likely liable; if substantiality were based on a qualitative measure then the argument would shift to the value of fraction of facilitating a small number of authorized file trades.

If the vast majority of material on the Napster system was likely infringing, the question of contributory liability depended on what the operators of Napster knew, and when did they know it? Unlike vicarious liability, which imputes responsibility for infringement to the supervising

entity, contributory infringement requires knowledge of specific acts of infringement, and the criterion of substantial non-infringing use for provision of the technological means to infringe is critical to determining the necessary knowledge. In the *Betamax* case, Sony knew that some consumers would abuse the recorder to make infringing copies of broadcast television programs, but it had no specific knowledge whether any given consumer at any given time was engaged in an infringing use or a substantial non-infringing use. By contrast, the centralized database in the Napster system made it easy for the court to conclude that Napster had the means to know, and indeed must have known not only generally about possible infringement, but about the particular infringing files that were being exchanged by means of its service.

Altered Architectures

Napster's centralized features thus formed the basis for both vicarious and contributory liability. Not surprisingly, the architectural basis of the Napster decision prompted a second generation of file-sharing systems based on technological architectures that attempted to avoid the centralized monitoring and control features that satisfied the knowledge requirement for secondary liability. For example, Aimster, a post-Napster file-sharing service that piggy-backed on the America Online chat application "AIM" (for "AOL Instant Messaging") employed an encryption feature that allowed only the file offeror and file recipient to know what was being transmitted over the system. When sued for contributory infringement by music copyright owners, Aimster argued that unlike Napster, it had no way of knowing what was in fact being shared, because the files were unobservable due to the encryption (*In re Aimster*, 2003). The Court of Appeals reviewing the case was entirely unsympathetic to this rationale, opining that adopting an encryption scheme to avoid knowing about illicit activity was itself sufficient evidence of knowledge to invoke contributory infringement, and holding that "willful blindness" to the content of the transmissions satisfied the criteria for liability.

Other peer-to-peer services took the design response a step further, sacrificing some of the efficiency and scaling properties of the Napster system to avoid the centralized features on which liability might be premised. Subsequent peer-to-peer systems such as Grokster, StreamCast, and KaZaa avoided any centralized monitoring or control point, adopting more fully distributed architectures that dispersed indexing as well as content and exchange among multiple network nodes. One approach, the KaZaa "Fastrack" network, located higher powered computers in the network and temporarily designated them as file indexing computers. Alternatively, the "Gnutella" open source network architecture employed by StreamCast fully distributed file search and location functions by passing a file request from computer to computer, serially searching the individual indices kept by each (*Strahalevitz*, 2003). Such designs allowed the purveyors of the software, quite truthfully, to assert that they had no means of knowing who or what was on their system at any given time, so that they had no ability to monitor or control the use of the system, and hence could not be vicariously liable for infringing activity.

Indeed, the United States Supreme Court tacitly acknowledged the success of this strategy by inventing a new form of secondary liability in its review of a subsequent legal challenge to the Grokster and StreamCast peer-to-peer networks (*MGM Studios v. Grokster*, 2005). Declining the invitation to revisit the *Sony* standard for "substantial" non-infringing use, or to opine on the

level of infringing use at which an inference of knowledge could be drawn, the Court recognized that the architecture of the Gnutella and Fastrack networks shielded the peer-to-peer services from knowledge of any specific act of infringement. But because there was separate evidence that Grokster and StreamCast had explicitly encouraged users to infringe, the Court reasoned that there was no need to draw inferences from the state of the technology; instead the services could be held secondarily liable for explicitly inducing infringement (Yen, 2006). In effect, the technical redesign prompted the court to articulate a new form of secondary liability that relied upon intent, and so required no centralized technical features as mechanisms for monitoring or control over the system.

Certainly the presence of secondary copyright liability places certain legal strictures on technical design related to content delivery. A technical constraint that was at least implicit in the *Napster* decision, and foregrounded in the arguments over Grokster, was the extent to which technology designers might be required to incorporate infringement defeating technologies into their systems. Both Napster and Grokster were castigated by the courts for failing to adopt some type of hash file matching, to identify and automatically block from the system files that matched the signatures of files owned by the music labels; failure to implement such systems was taken as evidence of an intent to encourage infringement. The implications of this inference have not been lost on other service providers; subsequently, content hosting sites such as YouTube have implemented automated systems of exactly this type. Such implementation has been “voluntary,” or at least volitionally adopted in order to head off some types of putative legal claims. The question left open in the *Napster* line of cases was whether adoption of best available infringing technology might be legally *required* to avoid the inference of encouraging infringement.

The development of the “substantial non-infringing use” standard in *Sony* was intended to answer this exact question negatively; to remove from technology manufacturers the responsibility of policing, even peremptorily, the possible bad behavior of some purchasers once the substantiality threshold is reached. It has been suggested that this holding of *Sony* can and should be distinguished; some commentators (Dogan, 2001; Picker, 2005), along with the plaintiffs in *Grokster*, have argued that Sony sold stand-alone machines that could not be easily monitored for infringement after distribution into the hands of consumers, consequently it made sense to excuse Sony from policing the conduct of its customers. However, current infrastructure allows for networked machines that could be designed for monitoring even after sale to consumers, and so requiring policing of how the technology is used makes sense. But this argument only pushes the problem back a step: if technology designers have the choice between networked and stand-alone machines, and are required to adopt infringement preemptive technology if they choose to create networked machines, they might design around such a responsibility by producing stand-alone machines. The same problem then recurs over whether to require network designs rather than standalone designs.

Technological Responses

If *Sony* stands for the proposition that non-infringing technical design is not legally required, the peer-to-peer cases suggest that legal requirements may nonetheless prompt technical re-design.

Grokster and KaZaa intentionally attempted to design around the contours of technological liability as mapped out by the Ninth Circuit in the Napster decision. But this type of designing around copyright's requirements is by no means unusual. It appears for example in the more recent *American Broadcasting Companies v. Aereo* controversy which was decided by the U.S. Supreme Court in the spring of 2014. The Aereo storage and transmission technology at issue in the case was explicitly designed to conform to definitions of permissible activity articulated in previous copyright cases. Specifically, the American copyright statute grants copyright holders an exclusive right of public performance for their works. Previous court decisions such as *Cartoon Network v. CSC Holdings* (2008) held that an individually stored recording of a broadcast television show, accessed by a particular user at that user's discretion, did not constitute a public performance of the show, but was rather a private performance, outside the ambit of the copyright holder's exclusive right.

In the *Cartoon Network* case, copyright owners of cable broadcast programs sued Cablevision, a provider of remote DVR services. Cablevision's service had essentially moved the video recorder out of the consumer's home to a centralized location, while still maintaining *Sony*-style decentralized control over the use of the technology. Subscribers could specify recording criteria and initiate recording. Recordings were made specifically for the particular subscriber and were accessible only by that subscriber. Since Cablevision was not initiating the recording of broadcast programs, direct infringement was not a plausible theory for the lawsuit. The case therefore turned on whether Cablevision was providing an unauthorized public performance of the recorded programs when it transmitted the recordings initiated by the subscriber. Because recording, storage, and playback were consigned to an individual consumer rather than generally accessible, the court held that the transmissions were private rather than public performances, and so not prohibited by the exclusive rights granted under the copyright statute.

Aereo built its service around technology meeting this definition of non-infringing private transmission. The Aereo system is comprised of thousands of tiny antennae that receive broadcast programming. Each antenna is assigned to an individual subscriber, and either transmits the signal directly to that subscriber via Internet streaming media, or stores the broadcast in an individual recording accessible only to the particular subscriber. Thus, every step of the Aereo transmission was designed to permit only "private" performances, not public performances as defined by the courts, and so to skirt the rights of the copyright holder as articulated in previous copyright decisions.

A majority of the reviewing panel in Second Circuit court of appeals, following the *Cartoon Network* precedent, agreed that Aereo's set-up provided a private transmission, effectively skirting the statutory exclusive right for public performances (*WNET v. Aereo*, 2013). Judge Chin in dissent asserted with some obvious outrage that the Aereo design was an "over-engineered" "Rube Goldberg" contraption, designed solely to avoid the letter of the copyright statute. Chin observed that there was no particular reason to design the system with tiny individual receiving antennae except as a dodge around the public performance right; absent the *Cartoon Network* definition of public performances, it might well have been more efficient to design a service for streaming and recording broadcast with a single receiving antenna. The Supreme Court largely agreed with this stance, stating in the majority opinion that it considered the technical of the streaming system irrelevant to the proper outcome of the case. Much as in

the *Grokster* case that went before, the Court appeared far more interested in achieving a particular result than in following the letter of the law, and held Aereo liable for publicly performing broadcast works without authorization.

Inventing Around Patents

But the outcome in *Aereo* and in *Grokster* present a puzzle. From the standpoint of intellectual property policy, the tendency to adopt designs that skirt the law is hauntingly familiar. A different branch of intellectual property law, patent law, has long entailed policy justification for “inventing around,” which is sometimes touted as one of the benefits of the patent system. Patent law is explicitly directed toward encouraging the development of new technology, rather than the development of new artistic or aesthetic content that is characteristic of copyright’s subject matter. And, unlike copyright, the boundaries of the patent holder’s rights are defined by textual claims in the patent document; infringement occurs in cases of unauthorized making, using, selling, offering for sale, or importing technology that falls within the technological definition spelled out by the claims. Competitors to the patent holder may therefore invest in developing substitutes that fall outside the claims, which is to say they “invent around” the obstacle of the patent right. Patents are intended to encourage innovation, and are usually assumed to do so via the reward of exclusive rights in a meritorious invention, but the “inventing around” rationale suggests that they may also somewhat perversely spur innovation as others seek permissible alternatives to the legally encumbered technology.

Inventing around in patent law is largely a result of textual formalism. Because the scope of patent rights is defined by written claims, determining the meaning of the claims requires interpretation. The settled first step in patent claim construction is deciding the literal meaning of the text, that is, assigning discrete denotations to words or phrases within the text. This defines a conceptual boundary that determines not only what technology is covered by the patent, but also what technology is *not* covered by the patent. Technologies that lack all the elements of the claims, or arrange components in some substantially different way, fall outside the formal denotation of the claims and so are not considered infringing. Competitors to the patent holder are considered perfectly justified in developing or adopting alternatives that lie outside the interpretive boundaries of the claims.

The positive view on the desirability of inventing around in patents is not uncontroversial. Although some commentators have agreed with the idea of inventing around as a positive spur toward innovation (Lemley, 2012), other commentators have been less enthusiastic about the concept, observing that inventing around patent rights may well lead to inefficient and duplicative invention by prompting development of unneeded or second best alternatives to patented technologies. As observed by Michael Abramowicz, (2003) inventing around is closely related to patent “racing” and the question of rent dissipation. Races to invent are typically considered wasteful, absorbing additional duplicative investment that eats up the value of the invention, and of any patent on the invention, before the invention comes into existence. Inventing around may be regarded as a sort of patent race in which one of the parties has already won: the other competitor is left to develop a technological alternative to the patent that has been granted.

The more positive view casts patent claims as a kind of innovation obstacle course, intended to build fitness and character in the competitors who are forced to navigate its hurdles. However, Martin Adelman (1982, p. 464) has argued that patent inventing around is unlikely to occur unless the patent holder and the competitor have very different estimations of the cost of developing an alternative technology. If the respective valuations of inventing around are similar, the parties are likely to be able to negotiate a royalty for use of the patented technology that will be lower than the cost of inventing around. Each party has an incentive to make this kind of a license work: the competitor will not wish to incur the inventing around cost if the royalty is cheaper, and the patent holder will set the royalty low enough to avoid inducing the competitor to invent around, as that generates an alternative to the patented technology. Thus inventing around, when it occurs, in some sense represents a bargaining breakdown.

Consequently, the positive view of inventing around requires a tricky allocation of economic surplus, as Suzanne Scotchmer (1991, pp. 34-35) famously observed, between the patent holder and the competitor. Sufficient surplus from the social value of the follow-on innovation must be allocated to the initial innovator who obtains the patent, otherwise the patent holder may not be properly motivated to invest in the patented item. At the same time, enough surplus must be allocated to the follow-on competitor to ensure the necessary investment in inventing around, and private licensing may not accomplish this. This suggests that incentives for inventing around may be deficient; just as inventing around may be socially wasteful if the private value to the competitor exceeds the social benefit of having a new alternative technology, so *failure* to invent around may be socially wasteful where the private value of the license to the patent owner exceeds the social benefit of having the new technology.

Internal and External Perspectives

Thus, some insight into copyright “inventing around” may come from copyright’s close cousin, patent law. But copyright is not patent, and it is important to know when to distinguish the two. Certain considerations can be drawn out of the more general analytical framework developed by Oren Kerr (2003). Kerr surveys a variety of Internet-related legal decisions and distills from them a pattern of decisional rationales adopted by legal decision makers when faced with applying existing law to technological fact patterns. Kerr notes that law makers tend to take one of two approaches to dealing with the affordances of a given technology to which an existing legal regime is applied. The first approach, which Kerr denominates the “internal” approach, tends to be purposive and outcome driven. This internal approach tends to merge the viewpoint of the decision maker into the technology, pushing technical processes into the unnoticed background. Consequently, under this approach the legal decision maker treats the results of a given technological process as epiphenomenal, largely divorced from the actual structure and function of the technology. The mechanics or workings of the technology are of little interest, rather it is the result that matters, however it was produced.

At other times adjudicators break open the black box of technological function to expose the inner workings, taking account of the mechanism by which the ultimate outcome is achieved. This second approach, which Kerr refers to as the “external” view, tends toward atomism rather

than holism, mapping the particular requirements of the law onto particular functions of the technology. Unlike the “internal” viewpoint, where the adjudicator is situated within the technological landscape, the adjudicator adopting the external viewpoint stands apart from the technology, observing it as an outsider, at arm’s length. Thus the specific workings of the technology become an important component of the legal analysis, and distinctions may be drawn between technical outcomes with different mechanisms or designs.

The divergence in approaches is both apparent and ubiquitous in the treatment of digital content delivery. To take a fairly clean example of digital content delivery, at about the same time that the recording industry was arguing in court against Napster, they also brought suit against an early “digital locker” service titled MP3.Com. The MP3.com service allowed users to receive streamed music from the subscriber’s collection by way of virtually any device the subscriber connected to the Internet. Subscribers were required to verify that they possessed a copy of the music by inserting providing a CD to be scanned by MP3.com software via the user’s own computer. Rather than uploading the music files to what we might now term “cloud” storage, the service would instead then stream copies that it had made of the music to users once a particular file was identified as being in the user’s possession.

When sued by the recording labels who held copyright in the streamed music, MP3.Com argued that, parallel to the fair use in *Sony*, its subscribers were merely “space shifting” their ostensibly legally purchased music content to access it in different places, much as viewers in *Sony* were “time shifting” authorized broadcasts to a different viewing schedule (*UMG Recordings v. MP3.Com*, 2000). This “space shifting” rationale had been accepted as fair use by contemporary courts in other contexts, most notably where music owners “ripped” files from CD recordings and moved the content to portable MP3 music players – the technological ancestors of the currently ubiquitous iPod (*RIAA v. Diamond Multimedia*, 1999). However, in those cases, music owners had copied and “moved” their own files to a different medium, which was judged not to be the case for MP3.com; MP3.com’s service made copies without authorization and streamed those files to the owners of *other* copies of the same file. The fact that MP3.com supplied the file, rather than the users supplying the file, was judged to be dispositive, and infringing.

Presumably had MP3.com required its subscribers to actually upload their music files, rather than only verifying that they possessed a copy of the file, they might have escaped liability on the space-shifting rationale. Subsequent digital locker services have been careful either to provide storage capacity to which users can upload their own files, or to provide access to files that users have previously purchased from that provider. At some level such distinctions seem like needless hair-splitting; each time the file is “moved” to a new medium, what in fact occurs is that another copy is made, so however the digital locker is arranged, someone is making an extra copy of the copyrighted content. Such an outcome-based view would be consistent with Kerr’s internal viewpoint, and with the position adopted by the service: subscribers were hearing “their” music, regardless of who made the copy. But since the court in *MP3.com* instead took what Kerr would call the external viewpoint, who initiated the copying, how the copying occurred, and where the copies were disposed became critically important to satisfying the statute.

Kerr’s insight is key to the outcome of the *MP3.Com* decision, as well as those of *Napster* or *Aereo*, because judicial adoption of an internal or external approach to digital content delivery

relates directly to the structure of statutory requirements governing such cases. As I have indicated above, copyright statutory provisions were typically drafted in response to previous copyright threats, and couched in the terminology of older media functions. As numerous commentators have observed, new media routinely adopt the form of older media: e-mail mimics postal mail, VoIP mimics telephony, Internet streaming mimics cable television, and so on (Bolter and Grusin, 1999; Manovich, 2001). To the extent that new media takes the form of older media, adopting Kerr's "internal" stance may lead courts to treat the new media as they did the old, since both present the same or similar character – indeed, in the *Aereo* decision, the Supreme Court declared that it would treat Aereo as if it were a cable retransmission system, because in effect it acted like a cable system, even if its technical operation was different. On the other hand, adopting the "external" stance would tend to lead courts to treat the new and old media quite differently, as the mechanics of the new medium are likely to differ significantly from that of the old, and may not map cleanly onto whatever processes or mechanics from the old medium that are embedded in the statute.

Technological Avoision

Some additional insights into copyright "inventing around" come, naturally, from the extensive literature on "law and code." If the response to the *Napster* decision was a conscious re-design of subsequent peer-to-peer architecture, it was no accident that the age of Napster was also the age of *Code and Other Laws of Cyberspace*, Larry Lessig's evangelical exposition on social action in the context of the Internet. Lessig, drawing on previous work by Joel Reidenberg (1998) and others, noted that social behavior can be constrained or channeled through a suite of modalities that include normative expectations, market forces, formal legal penalties, and technological structures. These constraints on behavior often operate in tandem, and can at times substitute for one another. Thus, unauthorized copying of files might be deterred by normative expectations that copying is unacceptable, it might be deterred by market pressure making authorized copying a less expensive alternative, it might be deterred by formal legal sanctions for such behavior, or it might be deterred by designing technical systems in such a way that copying is difficult or impossible.

As the title of his book indicated, Lessig was particularly interested in this last option, the design of "code" or technological architecture as a constraint. The title of the book and its discussion even engage in some provocative word play with the term "code," which in one setting may refer to the symbolic representation of computer operations, and in another setting may refer to formal written compilations of legal strictures. Lessig explores the interplay between these meanings in some detail, and is particularly interested in the need for social architects to rely on legal constraints – such as heightened copyright law enforcement – when technological design actually lowered barriers to activity such as copying and distribution, which the architecture of the Internet clearly did. In the years since his pathbreaking analysis, Lessig's thesis has become a part of Internet orthodoxy and has long since been incorporated into the canon of both academic discourse and popular action. Lessig's ultimate message was that architecture matters, and this was clearly the pragmatic conclusion embraced by the Grokster generation of network designers: if one technological architecture led to liability, a different architecture might lead away.

But such re-deployment of technical architecture in this fashion was perhaps not entirely what Lessig had in mind, and is certainly not the message for which he has become best known. Lessig suggested that technology could be deployed by governments, or for that matter by private parties, to constrain behavior; what has been less appreciated is the inverse proposition, that code sometimes supplies an escape from the imperatives of law, constituting a reaction or response to legal constraints. This was the coding corollary that the *Grokster* and *Aimster* engineers followed, developing technological structures in the wake of the *Napster* decision that would circumvent secondary infringement by removing the centralized structures that led to liability. In the case of patent inventing around, we have already seen Lessig's alternatives at work: law triggers either a market negotiation or a technical response. The re-design of digital content delivery follows a similar path.

As in the case of inventing around patent claims, formalism is at work in such re-design, but here again Lessig offers the prospect of a different perspective. Typically we think of textualism as a mode for interpreting written or symbolic texts, but Lessig's view of social and technological equivalence suggests that technology may be "read," or at least viewed, equally formalistically. Formalism need not be confined to written legal codes; the parameters of a technological implementation may similarly be treated as bright-line behavioral indices. Indeed, Kerr's external mode of analysis encompasses a type of technological formalism, regarding the features of the technology as discrete and definite units with which the discrete and definite units of a formal text can be associated. Kerr's internal view is by contrasts largely purposive, considering the desirability of the overall technological outcome, rather than the particularized mechanism by which the outcome is realized. To the extent that the courts in *Napster*, *Grokster*, and subsequent cases have adopted a formalistic view of technological architecture, it should not be surprising that technical designers have used the external approach as a springboard to avoid architectural liability, just as tax avoiders might attempt to re-structure business operations around the formalities of a written tax code.

To be sure, this subversive use of technical architecture has not gone entirely unnoticed; if Lessig's *Code* demonstrated the deployment of technological affordances to constrain behavior, Tim Wu's contrapuntal *When Code Isn't Law* (2003) explored technological design based on legal loopholes. Wu argues that the response to legal constraints will take the form of least cost avoidance; if compliance with law is the least costly alternative, then compliance can be expected to occur. But depending on relative cost, reactions to law may take other forms, such as litigating or lobbying to change law, or re-structuring of business plans to exploit legal loopholes. This latter effect is a common occurrence in taxation or regulatory compliance, which Leo Katz dubbed "avoision," a portmanteau of "avoidance" and "evasion" (Katz, 1996). Taking a page from Lessig, Wu observes that if formal law and technological constraint are at some level interchangeable, then avoision may occur by re-structuring technology rather than re-structuring behavior such restructuring is less costly than compliance.

But this picture, while useful, may be incomplete. Technological avoidance may not necessarily be legal evasion, at least not in the sense identified by Wu. In the Federal Circuit's view of patent "inventing around," such activity does not constitute avoision, at least under the definition discussed by Wu, of a least cost avoider attempting to avoid or evade the intent of the law. To be certain, competitors to a patent holder who invent around are avoiding the alternative of

infringement, and as suggested above they will presumably do so only if inventing around is cheaper than the alternatives of infringing or licensing. But avoiding the boundaries of patent claims is not the same as avoiding the intent of the patent law. To the contrary, inventing around patent claims is rather considered a legitimate and desired response to the law; inventing around is if not *the* intended response to patent exclusivity, at least *a* desired response to patent exclusivity.

Inventing Around Copyright

Thus, the response to the *Napster* decision and subsequent cases entails an effect, analogous to that in patent law, of “inventing around,” in which a competitor who might be an infringer is motivated to develop a new technological design that avoids infringement. In this fashion, it seems that copyright doctrine frequently functions in a similar fashion to the text of patent claims, creating a perimeter of rights that competitors can design around in order to remain outside the formal definition of infringement. This is largely an outcome of adopting Kerr’s external viewpoint. By defining the exclusive rights in copyright according to technological affordances, courts are simultaneously defining permissible technological workarounds for such rights. This effectively shunts technological creativity into particular technical instantiations that have been negatively – and perhaps unwittingly -- defined as non-infringing.

However, certain differences from patent law’s inventing around are apparent and important. To the extent that inventing around in copyright constitutes a bargaining breakdown, it is not the type of breakdown identified above in the patent context. The *Grokster* and *Aereo* systems are not alternatives or substitutes for copyrighted works; they are alternatives or substitutes for, respectively, compact discs or for terrestrial broadcast – that is, for existing methods of *delivering* copyrighted works. The goal of a *Grokster* or *Aereo* designer is not to circumvent a particular copyright, but to avoid liability for providing or delivering a *class* of copyrighted content. Thus copyright holders and innovators do not have different valuations of the cost of licensing the existing intellectual property versus the cost of developing alternative intellectual property, as might be the case in patent inventing around. The question for the competitor in copyright inventing around is not whether to invest in a substitute movie or musical composition. The disparity in valuation is rather more a comparison of apples to oranges; that is, contemplating the cost of licensing the intellectual property versus developing an alternative technological delivery system.

This asymmetry between the alternatives becomes starker on closer examination. Because the alternative to inventing around in copyright is not the development of an alternative creative work, the licensing alternative involves the collective action problem of licensing not a particular copyrighted work, but rather the rights against secondary liability held by all copyright owners whose works might be infringed by the delivery under the current technology. The transaction costs of licensing all the various copyright owners is likely to be extremely high. The copyright holders, at the same time, will tend to be invested in the existing technology that falls within the rights defined by the statute, or may possibly stand to benefit from new technologies similarly falling within the statutory ambit. The copyright holder thus has little incentive to develop or encourage development of technologies outside those limits.

This combination of asymmetric incentives is therefore likely to make the redesign or inventing around option highly attractive. Much as in patent, copyright inventing around may be socially wasteful for channeling inventive effort toward new methods of reproduction or distribution when adequate methods are already available. The social desirability of such inventing around depends upon whether Judge Chin's assertions are both correct and typical – whether designing a technological alternative to public performance, using scores of dime-sized antennae is an inefficient design intended only to circumvent some legal language, or whether it may instead constitute a useful innovation. But as a counterexample, it seems that the peer-to-peer architectures developed in the wake of the *Napster* ruling are in fact useful for some applications and society is better off possessing the technology – for example, at the time of this writing, Netflix appears to be considering such peer-to-peer systems as a better way to deliver authorized video content. So, at least some of the time, it seems that Judge Chin's view may be misguided.

Conclusion

As late as 2010, the entertainment industry was still locked in legal battles with peer-to-peer service providers, successfully enjoining the operators of LimeWire, another Napster successor operating on Gnutella technology (*Arista Records v. Lime Group*, 2010). Continuing the *Napster* secondary liability strategy, copyright owners alleged vicarious liability and contributory infringement, but the winning allegation was for Grokster-style inducement: the federal district court in that held LimeWire's failure to adopt infringement dampening technology was particularly strong evidence of intent to encourage infringement.

At the same time, however, such arguments gained less traction in the contemporaneous lawsuit by motion picture copyright holders led by Viacom against the YouTube video repository (*Viacom Int'l v. YouTube*, 2012). YouTube's defensive combination of an automated copyright policing technology and takedown procedures complying with provisions of the Digital Millennium Copyright Act provided a robust and credible response against secondary liability claims requiring nefarious intent, specific knowledge, or the opportunity to supervise and control. Thus, one technical legacy of the *Napster* line of cases might be movement toward adoption of technological measures for monitoring digital content, simply as evidence against allegations of knowledge or nefarious intent (Menell and Nimmer, 2007).

But far more striking is the pattern of “inventing around” legal formalisms that emerges from careful review *Napster* and its legacy. Although copyright is ostensibly directed to promoting creative works by securing exclusive rights to authors, in fact it has a somewhat hidden hand in fostering or shaping technological progress. By siting the exclusive rights of copyright in technical actions, copyright law fosters the conditions for repeated technological avoidance. And if copyright is unwittingly shaping such technological progress, this effect requires closer consideration and more explicit recognition, either as a policy goal or as a policy by-product, than Congress or the courts have granted it to date.

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