Wired Shut

Copyright and the Shape of Digital Culture

Tarleton Gillespie

The MIT Press
Cambridge, Massachusetts
London, England
Contents

Acknowledgments vii

1 | The Technological Fix 1

2 | The Copyright Balance and the Weight of DRM 21

3 | The Speed Bump 65

4 | A Heroic Tale of Devilish Piracy and Glorious Progress, by Jack Valenti 105

5 | Why SDMI Failed 137

6 | Protecting DVDs: Locks, Licenses, and Laws 167

7 | Raising the Broadcast Flag 193

8 | Effective Frustration 223

9 | The Cultural Implications of Encryption 247

Notes 283
References 345
About the Author 381
Index 383
Wired Shut ends there, with a concern well beyond copyright per se, the Internet and its regulation, and the juncture between industry and politics. It reveals a crossroads faced by a society embracing technologies that can both facilitate digital culture and be made to regulate it. The choices we make now will help decide whether we will be active participants in our culture and creative users of our technology, or passive recipients content to quietly embrace what is sold to us and fulfill the roles prescribed for us.

Developing technical solutions to the problem of enforcing copyright is no easy task. Copyright itself is a terribly complex legal doctrine, built over many years by many hands, full of exceptions and caveats that even legal scholars find "complex, internally inconsistent, wordy, and arcane." Moreover, its central aim may be unattainable, and is at the very least founded on a fundamental contradiction. In offering authors legal property rights over their work so they may enjoy a profit from its circulation, copyright is supposed to ensure the sustenance of art, knowledge, and culture. This precarious balance between public good and private gain, while logical in an ideal sense, may suffer from "the impossibility of serving one of the described objectives without disserving the other." And, in a society in which culture is predominantly delivered through the market, copyright (along with the laws regarding freedom of speech and the regulations attached to broadcast licensing) is one of the central rules that structure culture. As such, its interpretation and implementation have tremendous significance for art, journalism, scholarship, and the health of democracy.

On one level, shifting the locus of control from law to technology means mapping legal doctrines onto technical prohibitions, and risks losing something in the translation. Critics of digital copyright strategies have already pointed out a number of the legal details of copyright that don't fit neatly with what can be built into software. But more than that, the move to a technical copy protection creates an opportunity for practitioners, legislators, and users to subtly reinterpret and redefine the law itself; questions once settled can be reopened, while persistent tensions can be downplayed as if resolved. An existing balance can be undone, using digital technology as the urgent reason for why an old compromise no longer works, while new opportunities afforded by the Internet can be brushed aside as being simply incompatible with the traditions of
copyright law. More is at stake than just how pop music will be distributed online; everything about the rights associated with information is once again up for grabs, and the decisions made in this moment will set the terms for how we understand copyright and what it is supposed to accomplish for years to come. It is important, then, to look back at where copyright law came from, how it has been implemented differently over time and toward what ends, and how new challenges posed by digital computing and communication networks are both challenging copyright’s balance and serving as a rationale for a new legal and technical framework.

The Aims of Copyright

The language of the U.S. Constitution authorizing Congress to create copyright laws also announces its priorities: “Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” The book, song, film, painting, or software you create belongs to you by law; you have exclusive rights to duplicate, distribute, or perform that work, and legal recourse against those who attempt to do any of these things without your permission. Important to notice, first and foremost, is that at its foundation, U.S. intellectual property law is a means to an end, not an end in itself. William Fisher has noted that there are several countervailing philosophical justifications for the law of copyright, and these are regularly invoked by jurists and lawmakers, as well as by scholars, often unaware of their potential contradiction. However, while these all play a role in justifying copyright and structuring the complex debates about its application, the philosophical core of U.S. copyright law is that the individual’s right of ownership is lashed to a societal aspiration. Rather than justifying this privilege as a “natural” right of authors to enjoy the fruits of their own labor, or as a reward for expending the creative effort itself, copyright is framed in terms of spurring cultural and intellectual progress. As Matt Jackson reminds us, “One cannot overemphasize that the constitutional purpose of copyright is to stimulate content creation for the public’s benefit, not to create a private property right based on a moral notion of ownership.”

There is an important presumption about the nature of authorship and culture hidden in this constitutional mandate, that authors require financial incentives to motivate them to produce—or at least that ensuring such financial incentives will encourage more authors to produce more work more of the time. Or as Ronald Bettig notes, “The underlying assumption here is that human beings require economic reward to be intellectually or artistically creative. The philosophy of intellectual property relies economic rationalism as a natural human trait.” This may feel like mere common sense: While the idea that art is made “for art’s sake” may remain a powerful mythology among painters and punk bands, self-proclaimed realists tend to scoff at the idea that culture can ever be separated from commerce—or should be. The logic of a market economy suggests that authors need an assurance that they’ll be able to sell their work; the profits due to them must not be diverted by flagrant piracy. Copyright law attempts to assure this fair and productive arrangement, ensuring authors the ability to seek their just reward in the marketplace. Financial reward provides incentive, which provokes cultural production, which benefits society, QED.

Of course, to justify copyright in this way may be circular logic: It is only with copyright law in place that we have been able to design a cultural sphere premised on the assumption that work will circulate through the market and enjoy financial rewards, and that, by law, authors are owners. As such, we build industries around this “truth” conventionally see culture in these terms, cultivate this expectation in budding creators, and downplay the myriad of other reasons why people create—for creative satisfaction, for the promise of impact, for reputational gain, for ancillary rewards, etc. One need only look at the World Wide Web or at sites like YouTube, MySpace, Wikipedia, or SourceForge to see that financial compensation is not the only, or perhaps even the most compelling, incentive to produce. In fact, it is possible that the development of real alternatives to this strictly commercial arrangement for cultural production is actually inhibited by the self-fulfilling prophecy of copyright law, the stable social and institutional structures that depend on it, and the ideological assumptions on which it depends and thereby reaffirms.

Because our culture generally holds authors in high regard, it is easy to presume that copyright is in some way designed to reward authors because they deserve reward. This seems so obvious to some that it is a difficult proposition to even investigate. The widespread sense is that authors provide a valuable service, that their work is their own, and therefore that they have the right to sell it and reap the financial reward. In this way, authors enjoy legal protection because they create something worth paying for; piracy is taking something that doesn’t belong to you. Even as we labor within a corporate industrial system where workers have no rights over the things they help produce, we continue to believe in the principle that we own what we make and we deserve to be paid for what we create. It is
important to remember that this is not the case. Rewarding authors has never been the purpose of copyright—it is merely its preferred strategy. The law in fact has grander aspirations.

Eager to help their young nation grow but deeply skeptical of the power of monopolies (be they royal or commercial), those who crafted the U.S. Constitution justified copyright in terms of the social and the intellectual—in the name of “progress in science and the useful arts.” For them, “progress” may have meant a number of things. As a young nation, the United States hoped to gain its footing as quickly as possible; this required a spirit of cooperation in almost every endeavor: political, commercial, intellectual, artistic.

In each of these fields, there was (and continues to be) benefit in the unhindered circulation of information, knowledge, and culture. Democracy demands that every citizen be well informed, literate about the pressing issues, and capable of making informed decisions. The “marketplace of ideas” should expose citizens to lively, adversarial debate: Multiple and conflicting voices should all be heard: consensus will arise from citizens rationally considering alternative viewpoints. Commerce also depends on its constituents being well informed. The flow of goods and the setting of prices can only attain a fair equilibrium if consumers have “perfect information” about the products they desire, and if sellers know their potential buyers. In academic research, scholars should “stand on the shoulders of giants,” learning what the field has accomplished thus far, then contributing to it at its emergent edges. The scientific principle itself depends on past work being available for study and current work being available for scrutiny. Artists similarly learn their craft by being surrounded by the work of others; they emulate great masters and eviscerate mediocre contemporaries; they lift ideas and techniques from the work they encounter.

The challenge, then, was how to build the rules of culture such that individual creators are given rights and responsibilities in a way that will encourage them to make their work available to the public at large. Like the British doctrine it came from, U.S. copyright law turned the metaphor of property, applying the legal structure of ownership of tangible goods to the more intangible goods of “writings and discoveries.” This substitution is so commonplace that it’s hard to even recognize it as a choice, or to see that there is any alternative. To facilitate culture, we give every contribution to it the means to be traded on the open market and tie its sale back to its author/owner such that the financial reward returns to them. This is an effort to both encourage and control cultural discourse, to be both its distribution venue and its system of reward. The commodity stands in for the work; allowing the commodity to circulate in the marketplace presumably allows the ideas within to circulate along with it, resulting in a real marketplace built to support the marketplace of ideas. Far from being a free market strategy, as some copyright owners proclaim, this is very much an artificial regulation of the market—in the business of information, the most logical strategy in purely economic terms is in fact piracy, except for the fact that copyright law makes it illegal.

The Problem with “Property”

To call the story or the song or the image one’s “property,” while it may now seem intuitive, is an awkward and potentially problematic use of the term. In many ways, intellectual property does not work the way material property does, primarily because of its economic properties as a “public good.” First, cultural expression is nonrivalrous: Use does not deplete it. When you finish reading your copy of this book for the first time, it will in no way be diminished for a second reading. You can return to the book for years, reading it again and again, to your children and grandchildren. The same cannot be said for a candy bar, a firecracker, or laundry detergent. Of course, this is not a simple dichotomy. Sequential use might be seen as a spectrum, with different kinds of things having different half-lives—a tank of gas is consumed in one trip, but the car is driven many times before it is finally rendered unusable. You may turn the pages of this book so many times that the binding glue softens and the pages fall out, or you may smear the print with your thumbs to the point of illegibility. However, if you memorize the argument, you can continue to “use” it even after the pages are destroyed. A book may be exhaustible, but the “work” itself is not. Culture cannot be consumed.

Second, cultural expression is nonexcludable, in that once it is sold to one consumer it is difficult to prevent it from being enjoyed by others. We might think of this as having two dimensions: collective use of the same object, and duplication of one object into many. As noted before, cultural works are particularly susceptible to simultaneous and sequential use by many consumers—the hockey team rents a DVD to watch together in a dorm lounge, or the same magazine is read by every person who comes through the doctor’s office waiting room. It was (until recently) difficult to extract any payment from those additional consumers. In addition, intellectual property can be easily duplicated in a way that, say, a sandwich cannot. The fact that it is difficult to exclude those who did not purchase the work from using it, because of both sharing and copying, makes
be piracy of sneakers, since a pirate producer incurs the same costs of making each shoe as the original manufacturer, making it much more difficult to undercut their prices and lure away customers. There are no sneaker pirates, only competitors and knock-offs. 17

The production of creative work, on the other hand, tends to function on an economy of scale: the overwhelming majority of the costs of production are incurred before the very first product is made; the cost of making each additional commodity is tiny by comparison. The cost of making a film is practically the same whether you only produce the master reel or you distribute millions of copies on DVD. With discursive goods, it is the additional cost of each copy that is negligible.

Markets that exhibit an economy of scale tend to privilege large and well-established corporations. They are more likely to have the financial heft to commit significant capital up front and can afford to wait for the returns. Digital technologies of production and distribution may be changing this, as the barriers of entry are in some instances lowered, but this affects different kinds of content differently, and can never completely undo this dynamic. The problem is at its most extreme when the cultural work is most costly—that is, the summer blockbuster, the celebrity biography, the pop phenomenon, the sprawling documentary, the comprehensive database. This means it is those producers best positioned to produce expensive cultural work who will have the most vested interest in protecting and enforcing copyright.

That cultural expression doesn’t work like other tangible goods, even in its most tangible forms, is a problem only because we have chosen to embrace the legal metaphor of possession. With the “intellectual property” frame in place, other qualities of cultural expression are systematically ignored. There is no natural reason why we must conceive of it in such terms, but in the Western regulation of discourse, the property metaphor has long been the overwhelming and (for the most part) binding approach.

Striking the Balance

To assume that imposing this metaphor of property and regulating the market for culture will facilitate “progress in the science and useful arts” requires another very particular leap in faith. The fundamental risk with copyright law as it is currently designed is that, for each cultural work, it produces a legally enforced monopoly—I am the only one authorized to sell this book, or by contract the MIT Press is, which means there is no legitimate competition for buyers. Like all monopolies, this arrangement
is prone to commercial exploitation. But because the commodity in question is information, abuse of this monopoly position would not merely inflate prices or make a worthwhile product hard to acquire; it might deplete public debate, disable democracy, or starve art and culture. As Julie Cohen notes, “A model that attempts to relate ‘property’ to ‘progress’ must consider the public-good nature of creative and informational works, and cannot assume equivalency between private wealth and social gain.” The risk of a legally enforced monopoly over information is that publishers may be able to restrict the circulation of expression, which may in turn restrict the circulation of important ideas. In an attempt to avoid this, U.S. lawmakers and courts have built several limitations into copyright law, aiming to restrain the power it gives to authors/owners and pass some of that power back to the public at large.

Perhaps the most important of these conditions is the “limited times” referenced in the constitutional clause. These two words are perhaps the most powerful evidence that, despite relying on the property metaphor, copyright law does not intend to treat cultural expression exactly like property. Over the years, the duration of copyright protection has been dramatically lengthened, but the principle remains that authors may only enjoy their rights over publication and reproduction for a certain number of years. Once this time has elapsed, the work enters the “public domain” and can be freely reproduced by anyone. Unlike material property, this kind of property reverts to public ownership after a certain period of time—we might say it is returned to the original owners, if we think of copyright as a right temporarily granted to authors by the public they serve.

Copyright also protects only an author’s particular expression, and not the underlying ideas it conveys. In other words, although I am granted ownership and control over this book about copyright and the Internet, it does not mean that I can prevent others from also writing about copyright and the Internet; I can only prevent their use of my specific words. If copyright privileges extended too broadly around a work, any work that addressed similar topics might be deemed infringement. Without this distinction, copyright could easily become a mechanism for controlling information, depleting the public domain, and chilling free speech. Ideas are free to circulate, and can never be constrained; copyright, as long as it honors this distinction, will then never run afoul of the First Amendment’s assurance that no law can prevent me from saying what I please. All that I must avoid is actually using the phrasing or design of existing work. As James Boyle puts it, “The idea/expression division resolves (or at least conceals) the tension between public and private... By disaggregating the book into ‘idea’ and ‘expression,’ we can give the idea (and the facts on which it is based) to the public world and the expression to the writer, thus apparently mediating the contradiction between public good and private need (or greed).” The problem, of course, is that the distinction between idea and expression is really only a theoretical one; the two always coexist in practice, and the task of distinguishing infringement from works that simply explore similar ideas is left to jurists.

The most important of these limits, especially in light of recent controversies, is the “fair use” doctrine. The greatest risk of an unlimited copyright is that copyright owners might be able to enforce their rights in ways that inhibit the production of new work, squelch the expression of particular opinions, or undermine the health of public discourse. Quoting someone’s book requires copying and distributing some of their work; so does making copies of an article for use in a classroom. Both would require asking permission of the owner and, in most cases, compensating them financially. But if quoting someone’s work means having to ask permission to do so, the author is in a position to simply say no if they don’t like how their work will be used. If teachers cannot afford to pay for the use of works vital to their courses, they might not use them despite their value to the students. This is particularly problematic when either the use is critical of the original (a damning news report or a negative book review, for example) or the sheer cost of seeking permission of the owners and paying for the right to use their work would be prohibitive (amateur documentary filmmaking, for example). Some of these reuses are common to the most important democratic mechanisms of our society: education, scholarship, journalism, and criticism.

In cases like these, fair use allows some breathing room for the reuser by limiting the conditions under which they can be prosecuted for infringement. The fair use exception grants special protection to uses that would otherwise be infringement; that would be unlikely to receive authorization from the copyright holder, and that without fair use would be a violation of the law. The law delineates four factors that courts weigh when determining if an infringing use should be protected: What kind of work is being copied, how much is taken, what financial impact the copying might have on it, and to what use it is put.

Fair use originally focused exclusively on what William Patry calls “productive uses”: uses that create a new work by a new author. But in the last half century fair use has been expanded, hesitantly, to include certain “passive uses”: uses that duplicate some or all of the copyrighted work
without any obvious intellectual contributions, but do so in order to facilitate access to it. The 1976 Copyright Act created a special dispensation for photocopying copyrighted materials under specific circumstances: single copies, for educational purposes, by libraries and public archives. Multiple copies for use in the classroom are also included in the fair use exemption, although subsequent case law has designed very specific restrictions on that activity. The *Sony v. Universal* decision made room for copying television broadcasts onto videotape, again under specific circumstances: for the purposes of limited educational use or “time-shifted” personal use, with restrictions on how long copies can be kept.

There are a number of justifications for such an exception. Fair use serves as a further safety valve between copyright law and the First Amendment. If copyright law permitted authors to restrict how others could speak when using their work to do so, it could limit free expression; fair use offers the second speaker some breathing room, setting limits on how they can be held liable for infringement, and bounding the reach of copyright owners when the use of the work does not directly damage its market value. Fair use also helps mitigate the transaction costs involved: if each and every use required a license, the cost and difficulty of locating the proper copyright holder and negotiating each license might inhibit some uses. Finally, fair use has allowed some flexibility for technological innovation. New technologies often allow users to do things with information that can look like copyright infringement on first glance (for example, taping television programs using a VCR); fair use allows the courts to first consider, and sometimes indemnify, a new technological practice that could otherwise have been squelched as copyright infringement by existing economic forces.

If ideas both do and do not act like property, then the law of copyright alone cannot fully ensure their circulation. The installation of a property law entails orchestrating a massively complex alliance between law and market, lashing together stubborn and sometimes conflicting cultural rhetorics to justify it. Copyright is imagined to be the best means of circulating ideas and nourishing those aspects of society that rely on them, but even its designers fretted about its consequences and vulnerabilities. Most clearly in the doctrine of fair use, the law itself acknowledges that the commercial exchange of intellectual property is far from an ideal mechanism for the circulation of discourse. Some argue that copyright is sufficient, the best compromise for achieving important cultural goals. Others fear that the premise itself is flawed, and that a mountain of caveats couldn’t undo the damage copyright law does.

**Accommodating New Technologies**

Thanks to a series of technological innovations, copying and distributing cultural works has grown easier over the last century. With the Internet, it has reached unprecedented simplicity. And whereas the casual redistribution of intellectual property was always a problem in the culture industries, the new scope of that distribution is unheralded.

With each information technology, be it the jukebox, radio broadcasting, television, Xerox machines, the VCR, or cable, has come a reappraisal of the copyright balance. Of course, it isn’t just technology that stirs up old copyright questions: The logistical compromises of the past can be unraveled by an innovative business model, a new alliance between producers and manufacturers, or a shift in the way culture is consumed. The current debates about copyright have as much to do with the cultural dominance of media content, the increasing concentration of the industries that produce it, and the political climate of market deregulation as they do with the computer and the Internet. The embrace of the global information economy and the shift toward what David Harvey calls “flexible accumulation” models of post-industrial production have not only fueled the development of digital information networks and put personal computers on every desk; they have also encouraged a “digital culture” in which users expect information to be instantly accessible and easily portable, increasingly see themselves as producers and collectors of information as much as consumers of it, and accept the commingling of leisure- and work-related communication activities. All of these changes put pressure on copyright and the traditional forms of information distribution.

But typically it is the technologies that come to herald and stand for the cultural and economic shifts that helped produce them, and as such they become the flashpoints for the legal dispute that follows. The technologies represent both the potential of shifting the balance of copyright to account for new dynamics in the circulation of culture, and the justification for why an older balance must be preserved or regained. Of greater consequence than the new technologies themselves are the decisions—legal, economic, political, cultural—that we make around them.

With the emergence of the Internet as a technological and a sociocultural phenomenon, the already unsteady balance of copyright seemed, quite visibly, to explode. The proclamations were dramatic. Some believed that the law needed to be fortified and expanded to counter the Internet’s effects. Some thought copyright could shift from a law of property to a kind of contract law for managing relationships between content providers...
and consumers.\textsuperscript{34} Others believed that copyright could be discarded altogether.\textsuperscript{35}

Long before this vox populi eruption of excitement and concern, the Internet was an obscure engineering project commissioned and overseen by the Advanced Research Projects Agency (ARPA), a subsidiary of the U.S. Department of Defense (DoD).\textsuperscript{36} Drawing on innovations in digital computing and packet-switching communication networks developed in semi-autonomous research centers (including most notably the RAND Corporation, a nonprofit research group devoted to projects with broad military relevance),\textsuperscript{37} researchers at ARPA developed the protocols to allow computers to interface—that is, to exchange digitized information between geographically disparate locations and allow users to access and manipulate remote computers from a distance. Only four computers at first, the ARPANET slowly grew as university computer science departments with military funding established their own nodes fitted with the same shared protocols and logged on to what would eventually become the Internet.\textsuperscript{38}

The network’s early uses were mostly just efforts to test the system; it was too new to be trusted with important tasks, but too exciting to be left alone. Operators of the system tended to encourage any use at all; according to Janet Abbate, “In the early years the ARPANET was underutilized, and ARPA had little reason to discourage users or activities that might make the network more popular. Increased use of the network would also make it easier for ARPA’s computer scientists to evaluate the system’s performance.”\textsuperscript{39} So it was of little concern that some early users, particularly graduate students at the various university research centers, began to use ARPANET to send messages from site to site.

The emergence of these communicative activities ended up broadening the early focus of network research. While the military interest in network technology did include sending messages to remote sites, particularly under adverse conditions of war, researchers had more generally assumed the network would be a way to share computing power over a distance; a user at site A could log onto and run a computer at site B that specialized in crunching data in a way he needed, without having to send that data away to be processed, or having to purchase another costly computer himself. The growing population of users seemed to have a different idea. As Katie Hafner and Matthew Lyon tell it, “In the mind of its inventors, the network was intended for resource-sharing, period. That very little of its capacity was actually ever used for resource-sharing was a fact soon submersed in the tide of electronic mail… The ARPANET’s creators didn’t have a grand vision for the invention of an earth-circling message handling system. But once the first couple of dozen nodes were installed, early users turned the system of linked computers into a personal as well as a professional communications tool. Using the ARPANET as a sophisticated mail system was simply a good hack.”\textsuperscript{40}

As researchers noticed the activities of ARPANET users, the initial focus on distance computing gradually shifted to include this interest in distributed communication.\textsuperscript{41} Both purposes would persist in the further development of the Internet, but much of the Internet’s design and deployment would revolve around imagining new forms of \textit{distribution} of cultural expression—by all users. Still, it’s worth noticing that the initial premise of the network, computing at a distance, was based on the principle of transmitting exact copies of digital content so that the computer at the remote site could run that program or crunch those numbers and return the result. Though the copyright implications of this may not have been fully anticipated, the idea of transmitting perfect copies of authored work was by no means the invention of peer-to-peer file-traders, but was crucial to the earliest notions of what the network would be for.

With this surge in interest in distributing information across the new network came a particular politics about doing so. Early users were fascinated by the way the network seemed to be almost self-organizing: Data could move without centralized oversight, and users seemed able to share the network without needing a controlling authority to oversee them. Once the shared protocols (the technical language each computer would speak) were established, each user could focus simply on their own contribution to the system. The activity would be patrolled, if at all, by the users themselves; the tool seemed to encourage certain activities without enforcing them as explicit rules. Eventually, when the military began to fret that so many unauthorized users were accessing this system, they chose to split off their own proprietary network that they could control access to, rather than attempt to wrestle this unruly community of ARPANET users into submission.

\textbf{The Netizens Vision}

So perhaps it is no surprise that, as this technology gained public visibility, the prevailing opinion among its early users was that it should be given free rein, rather than being regulated by government. These (self-described) “Netizens” ardently believed in the liberating potential of the new technology, and of technology in general. Many had cut their teeth on the anti-authority counterculture rhetoric of the 1960s.\textsuperscript{42} They had been enlisted (ironically, by the military) to design a tool that wouldn’t have or
need a central mechanism of organization and control. Their solution was a decentralized network designed and maintained by an equally decentralized set of user communities working by association rather than under regimented, official oversight. This produced a network distinctly open in both its technical workings and its cultural ethos.

Part of this community’s enthusiasm was a faith that changes in technology have the power to transform the world. The early rhetoric is revealing: Now-familiar platitudes like “the Net treats censorship like damage and routes around it” and “information wants to be free” accord a sense of agency to things and ideas (“the Net treats,” “information wants”) and presume that change is nearly inevitable (the same declarative certainty so common to sociopolitical rhetoric). The assumption may in fact be a disempowering one. As Duguid observes, “Freedom of information, once a citizen’s right to gain access to information, by a sleight of argument becomes the right of information to move freely, free of material impediment.” But the appeal of this notion is undeniable. The Internet represented a complex network on a scale never before envisioned, with much of that complexity managed by the interaction of tools rather than by authorized institutions. In the eyes of these user-designers, the Internet seductively offered a ground for potentially perfect freedom, which, to them, meant free speech, human creativity, unfettered innovation, and robust community.

Much of the early community discussions focused on authorship and the shifting Politics of distribution. The Netizen vision held the new technology up as a solution (sometimes characterized as inevitable, sometimes as the best among many) to a fundamental problem of communication—that the division of labor between the production of information and its distribution often affects what can be said and by whom. The system of distribution Netizens wanted to undo (i.e., corporate broadcasting and mass-market print) exaggerates the distinction between producers and the rest of us; they hoped the Internet would up-end that distinction by allowing everyone to be a user, a participant, a citizen of cyberspace. Instead of the “consumer-as-commodity” model common to broadcasting, the Internet would foster a network of users bound by loose social ties; their work would circulate according to a gift economy rather than strictly commercial imperatives. By handing the power of distribution to anyone who wanted it, Netizens hoped to create communication that would be more about open interaction than exclusive publication.

What happens to copyright, a law that grants authors the power of distribution within a market-structured culture (and generally through professionalized media to a mass audience), when a new communication medium reimagines what is distributed, by whom, under what conditions, and to what ends? Some believed that copyright wouldn’t work online because the market transactions it supported wouldn’t survive in a digital, networked environment. John Perry Barlow, for one, speculated that the immateriality of digital information would undermine the traditional distribution of culture. When information is delivered in a material form—book, CD, film, photo—rules about information can depend on its material dynamics. With the Internet, “digital technology is detaching information from the physical plane, where property law of all sorts has always found definition.” The material existence of cultural expression gave the law something to hold onto, just as it gave the market something to assign a price to. Once digitized, information might travel from author to reader without taking any more physical form than an electrical impulse. Would we need copyright at all in such a frictionless environment? Nicholas Negroponte focused on the ease of distribution. With a global, digital network, the process of distributing someone else’s work was simpler, and enjoyed a dramatically broader scope. Mass distribution, once the near exclusive domain of institutions, now became available to the individual. Copyright would not need to assure the kind of financial incentives it once did, because the costs of distributing information would so significantly decrease in a digital world as to be negligible. Esther Dyson argued that content providers would do better to forego selling their content and instead recoup costs from ancillary markets or charge for service relationships around the use of the work: maintenance, training, arrangements with businesses that want users to seek them out, and so forth. “Content providers should manage their businesses as if it were free, and then figure out how to set up relationships or develop ancillary products and services that cover the costs of developing content.” Copyright, instead of imposing a metaphor of property, could instead oversee the ancillary human interactions such that profit could flow from them.

Some went even further. Weaned on the viral communities developing over the Internet, some believed that the social dynamics of those communities and of the Internet itself would sustain the flow of information. In a Netizen utopia, cyberspace would not only be freed from the limitations of the human body and the impositions of government legislation, but also shed the demands of the market. Ideas would run free across a networked “hive mind” organized around information flows rather than the well-worn routines of real-space commerce. Copyright simply has no place in this vision of the Internet as a gift economy; the changes to
information were too dramatic, the risk of its restriction too great. Borrowing the dual rhetorics of technological inevitability and political libertarianism so pervasive in the Netizen discourse, Barlow spoke as if copyright was already rattling its last breath: “It may well be that when the current system of intellectual property law has collapsed, as seems inevitable, that no new legal structure will arise in its place.”

The Clinton-Gore Vision
The common Netizen complaint about what happened instead, that this once-free and anarchic cyberspace has been tamed by bureaucrats with little understanding of its potential, is curiously naïve considering the Internet’s military ancestry. The U.S. government, via the Department of Defense and later the National Science Foundation (NSF), has always had a guiding hand in the design and implementation of the Internet. As the Netizens were proclaiming their techno-libertarian information policy on websites, in cyber-fetish magazines like Wired, and in dotcom consultant manifestos, the federal government was beginning to articulate its own vision of the Internet’s future in a series of policy initiatives. The Clinton administration, driven by technophile Vice President Al Gore, appointed a task force to help plan for the financial and infrastructural sustainability of the Internet—or what they dubbed the National Information Infrastructure (NII). Committees and working groups were developed on a number of foreseeable issues: universal service, technological innovation, interoperability, privacy, government use of IT, and intellectual property. The working groups enlisted federal agency directors and representatives from the private sector to together develop a policy agenda for supporting and expanding the Internet into an “information superhighway”—and one particularly amenable to U.S. interests.

The language of this NII plan makes claims about the Internet and its potential ramifications as bold as the Netizens’ starry-eyed predictions, serving up the same assumption—that technologies spur radical change—to both defend the urgency of this effort and rationalize its cost.

All Americans have a stake in the construction of an advanced National Information Infrastructure (NII), a seamless web of communications networks, computers, databases, and consumer electronics that will put vast amounts of information at users’ fingertips. Development of the NII can help unleash an information revolution that will change forever the way people live, work, and interact with each other . . . the NII can transform the lives of the American people—affecting the constraints of geography, disability, and economic status—giving all Americans a fair opportunity to go as far as their talents and ambitions will take them.

This information revolution could only happen in the NII model, when cyberspace was rendered hospitable to investment and commerce. The sense of liberation and possibility—geographic, educational, bureaucratic, physical, economic—provided a utopian justification for a policy committed to, first and foremost, encouraging private investment in the infrastructure and content of the Internet.

The Clinton-Gore vision of the Internet as a vibrant new marketplace for information provided the perfect contrast to the dystopian concerns about copyright that emerged from the NII Task Force’s working group on intellectual property issues. The group was led by Bruce Lehman, then Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, and at one time a lobbyist for the software industry. Lehman’s policy suggestions, released in July 1994 as the Green Paper draft and updated in September 1995 as the official White Paper, began with the NII assumption that the Internet could and should be a vibrant marketplace for information. If this marketplace were made safe for vendors to ply their wares, they would naturally choose to fill it with the best and widest array of cultural goods. Without adequate protection, however, those content providers would be reluctant to bring their goods to that marketplace:

The full potential of the NII will not be realized if the education, information, and entertainment products protected by intellectual property laws are not protected effectively when disseminated via the NII. Creators and other owners of intellectual property rights will not be willing to put their interests at risk if appropriate systems—both in the U.S. and internationally—are not in place to permit them to set and enforce the terms and conditions under which their works are made available in the NII environment. Likewise, the public will not use the services available on the NII and generate the market necessary for its success unless a wide variety of works are available under equitable and reasonable terms and conditions, and the integrity of those works is assured. All the computers, telephones, fax machines, scanners, cameras, keyboards, televisions, monitors, printers, switches, routers, wires, cables, networks and satellites in the world will not create a successful NII, if there is no content. What will drive the NII is the content moving through it.

On the other hand, this marketplace would be undercut by the Internet’s capacity for unauthorized reproduction and distribution of information:

Advances in digital technology and the rapid development of electronic networks and other communications technologies raise the stakes considerably. Any twodimensional work can readily be “digitized”—i.e., translated into a digital code (usually a series of zeros and ones). The work can then be stored and used in that digital form. This dramatically increases: the ease and speed with which a work can be reproduced; the quality of the copies (both the first and the hundredth
"generation" are virtually identical; the ability to manipulate and change the work; and the speed with which copies (authorized and unauthorized) can be "delivered" to the public.54

The ease of network distribution and the exactitude of digital reproduction offered by the Internet meant that copyright restrictions would need to be even broader and more rigorously enforced.55

This is merely the latest instantiation of the incentive logic of copyright, matched with the belief that content provides an incentive to technological adoption—a commonplace assumption as old as the adoption of radio. But the particular metaphor being used here is an insidious one: While Lehman may or may not have meant "market" literally in the sense that every bit of information provided online would come with a price tag attached, it is increasingly difficult now to think outside of the market analogy when describing the character of the Internet. The metaphor paves the way for an Internet that is more or less (or only) a vehicle for commerce, including both intellectual property and more tangible goods. This makes property-based laws of distribution the most relevant framework and gives them a rhetorical high ground: Within the incentive logic, allowing publishers to charge for every use "would better fulfill the constitutional purpose of copyright, because the greater the financial return to them, the greater will be their incentive to make works available to the public."56 In place of the copyright "balance" that recognizes that a monopoly intended to serve the public might also limit it, the incentive logic tends to see stronger copyright protection as precisely what will ensure the public good—in other words, more is always better.57

The working group's perspective replaces the information playground imagined by the Netizens with a dichotomy between the legitimate distribution of content and the rampant piracy always ready to undercut it. To do so requires neatly equating communication with commerce, but this is a logical and unproblematic leap if you believe the best way to spur the growth of the Internet is to allow private investment to transform it into a marketplace. The metaphor becomes its own justification:

The absence on the NII of copyrighted works for which authors do wish to exercise their rights—fully or to some limited extent—under the copyright law, of course, would not necessarily result in its demise. The Internet, in fact, could continue to serve as a communications tool and resource for Government, public domain and works of willing authors. However, unless the framework for legitimate commerce is preserved and adequate protection for copyrighted works is ensured, the vast communications network will not reach its full potential as a true, global marketplace. Copyright protection is not an obstacle in the way of the success of the NII: it is an essential component. Effective copyright protection is a fundamental way to promote the availability of works to the public.60

It should come as no surprise that this perspective was in near-perfect alignment with the view of the major content industries. The efforts of the working group were motivated in large part by the major record labels and movie studios, who were already vigorously lobbying for stronger protections, and who certainly hoped to play a part in the global, digital marketplace envisioned in the NII initiative.62 (The White Paper would also become the foundation for the Digital Millennium Copyright Act of 1998. This is discussed further in chapter 6.)

The Netizens dreamed of a new relationship between authorship and distribution; authors could distribute their own work, reaching interested readers without having to enter into the commodified and increasingly mega-corporate system of distribution that characterized existing forms of cultural discourse. The Internet would provide a forum where individuals could have a presence, and would provide the building blocks for innovative distribution schemes to develop in the future. Copying, now made perfect by digital technology, would be the foundation of this distribution system, and should be embraced. The system of distribution common to traditional media, which depended on copyright, would enjoy no strategic advantage on the Net; its failings would be overcome in the new medium. The Clinton-Gore vision, on the other hand, looked to conventional media producers and traditional copyright law as precisely the means for supporting the Internet. Concerned that, as a medium of information distribution, the new technology would fail unless it could be filled with viable content, this group planned to assure existing content producers a protected and profitable means of distribution. This meant both embracing the logic justifying copyright and the distribution system it helped spawn and ensuring that the traditional media system would enjoy a strategic advantage on the Internet, with the law's help. Copyright would have its work cut out for it, and should probably be strengthened, because the Internet seemed to copy so perfectly and promiscuously that the worst pirate tendencies would be facilitated.

What all of this initial rhetoric tended to overlook was that the technology itself was, and is, still up for grabs; each side of the dispute treated the Internet as a given thing, a fixed and stable object around which to make claims. This may have been error, or it may have been strategy; rhetorical claims often hold the material object still in order to build on something known, to make some outcomes appear inevitable. Regardless, technology refuses to hold still, because it too is entangled in the same
social dynamics. The cadre of technologies that together form the Internet were and still are very much in development. Moreover, their development has continued within the context of these evolving disputes, and has been shaped by them. Those with the power to intervene can use and even adjust the technology to leverage particular goals. Even the earliest claims about what the new technology was for—distance computing, or networked communication, or information distribution, for example—were not merely technological facts. They resulted from research priorities and design decisions, which were already shaped by debates about the needs of military control, academic research, and social communication, and by the values of the designers and institutions involved in those decisions.

As the Internet took root in public life, these arguments about copyright emerged and developed as a tangled mess of claims and uses, rules and tools. Applications of the technology by users would be countered in legal arguments for their prohibition; technological limitations established and supported by law would be challenged by statements undermining those limitations; political claims criticizing legal rules would be embodied in technological innovations that changed the way people would make rhetorical arguments. It would be inside those controversies that these concerns about law and technology, design and use, private and public, commerce and communication, and authorship and distribution would be negotiated. The biggest of those controversies arrived in 1999 with the introduction of a little software application called Napster.

The Cultural Politics of Peer-to-Peer

As the National Research Council noted in its influential 2000 report, music has been the “canary in the coal mine” for the digital copyright wars. Millions of copies of digital music in an unprotected format were already in the hands of consumers (in the form of CDs); in this encoded form, songs could be further compressed to relatively small file sizes, meaning download times were reasonably fast; music sharing, along more informal networks of friends, was already commonplace and largely overlooked by the industry. Together these conditions made music the first form of commercial culture to begin circulating widely online, and the first case to spark the dilemmas anticipated by Netizens and the NII.

Well before the arrival of Napster, the dimensions of that dispute were already taking shape around digital music. As artists, fans, entrepreneurs, and hardware manufacturers approached the new technology, each began to envision ways in which the Internet might serve as a vehicle for music distribution, perhaps even offer it new form, wider reach, and greater consequence. As these ideas were put into practice the record labels, themselves just beginning to work out what the Internet might offer, decided to counter these visions with a hard-line legal stance against what they characterized as piracy. As these competing discourses came into conflict, each began to articulate the technological affordances, the economic dynamics, and the legal principles they hoped would justify their aim.

It was back in 1987 that Italian researcher Leonardo Chiarglione petitioned the International Organization for Standardization in Switzerland to lead the development of standards for digital audio and video. With the official sanction of the ISO, its Motion Picture Experts Group (MPEG) sought out like-minded research teams; one response came from German researchers at the Institute for Integrated Circuits of the Fraunhofer Gesellschaft, who proposed a codec that shrank the size of sound files at an 11:1 ratio by removing elements of the recording the human ear cannot register. The standard was designed to be open, meaning both that it included no protection mechanism or encryption and that anyone could have access to the standard in order to design software to work with it. Chiarglione’s group dubbed the German codec “Level 3,” and incorporated it into its first proposed standard, “MPEG-1.” The ISO approved the MPEG formats as the new standards in 1992, but some time during their deliberation, a hacker named SonoH slipped unnoticed into Chiarglione’s university server and lifted the codec. The new format, dubbed “mp3,” quickly spread online and was embraced as the de facto audio format by hackers and online music aficionados. Within two years, high-quality music files were circulating online by the thousands on newsgroups and fan websites.

Some artists began posting their own music in mp3 format, especially those without major label contracts, hoping the Internet might help loosen the corporate stranglehold over popular music and forge a more direct connection between artist and fan. A number of new websites, like MP3.com, began hosting authorized copies of music from unsigned artists and, in the process, began experimenting with different models of distribution, and different models of copyright and contract arrangements. But not everyone was quite so scrupulous. There was a burgeoning black market for mp3 versions of popular, copyrighted music. Software for “ripping” a CD into mp3 format was free and quickly becoming ubiquitous. Some of this digital music was made available for download on personal websites, more was traded person-to-person via e-mail and in Internet Relay Chat exchanges,
and even more was collected on semi-private, password-accessible file servers. As Jonathan Sterne notes, the very design of the mp3 format put a high priority on portability; users quickly found it well suited to casual distribution of music online.68

Despite a few early efforts to make songs available on the Internet as promotional vehicles, the major labels remained reticent to use the web without some certainty that they could control what happened to their product. The protected formats they preferred, such as Liquid Audio and a2b, were incompatible and clumsy, and consumers seemed generally uninterested. But mp3 posed a dilemma; it was widely embraced by precisely the consumers they hoped to keep, but it afforded no protection—with it, copyrighted music could proliferate widely across the Internet, with no financial compensation to label or artist. The record industry wanted very much to curtail what they saw as widespread piracy, and they began deliberately speaking of it in those terms. But they also did not want to seem behind the curve in terms of what the Internet could offer.

So as music fans went online to share mp3s, and dotcom startups challenged the major labels by building clearinghouses for digital downloads, the major labels felt it necessary to contain these challenges, both by articulating their place as the natural patrons of a shift to digital music, and by outlawing the alternatives. The record industry began exploring a number of different strategies: educational, legal, commercial, technological. At the start, copyright law was the most powerful tool in their arsenal. As early as 1997, some of the major labels were sending out “friendly warnings” to the hosts of FTP servers and websites that were posting their music.69 By early 1998, the RIAA had three full-time staff whose job was simply to search the web for mp3s of copyrighted music and, as a stopgap measure, send cease and desist letters to the individuals who had posted them and to their Internet service providers.70 Soon they began developing automatic applications to scan the web for unauthorized mp3 files and churn out cease and desist e-mails. The industry similarly challenged upstream labels and manufacturers with the threat of lawsuits. They failed to stop Diamond Multimedia from releasing the first portable mp3 player; they enjoyed more success in their lawsuit against MP3.com for the personal music storage service they tried to introduce in 2000.

As Richard Barbrook predicted, “The greatest threat to the commercial music corporations comes from the flexibility and spontaneity of the high-tech gift economy.”71 This was most apparently true with the meteoric popularity of Napster and the peer-to-peer (p2p) applications that accompanied it. With Napster, the record labels faced a more dramatic problem than before. Certainly, the software made it substantially easier to redistribute copyrighted music casually and on a much wider scale. But Napster also threatened to change the balance of power of who did the distributing. Rather than using a clearinghouse model like MP3.com, peer-to-peer lets users be distributors as well. This does more than widen the scope of distribution. It challenges the very assumptions the music industry relies on for profit and longevity: the privileged place of artists and their designated patrons; the assumption that cultural expression moves in one direction, from the few producers to the many consumers; the relentless commodification of that cultural expression; and the management of those commodities by established corporate interests through copyright.72

In some sense, Napster was itself the product of the simmering copyright battle already underway. In 1998 Shawn Fanning, a computer science student at Northeastern University, would surf the Internet with his friends for mp3 files, which meant trawling through massive archives of unknown bands at sites like MP3.com, and more likely skipping through “warez”73 sites in search of an unauthorized copy of a more popular song. In part because of the efforts of the RIAA and in part because of the limits of search engine technology at the time, finding these files was an arduous, though not impossible, task. A website blatantly offering copyrighted music would draw the attention of RIAA lawyers, eliciting at least a cease and desist letter, or a call to the ISP, maybe even a NET Act74 lawsuit. So mp3 sites were fleeting, burned, dilapidated, outdated. Fanning decided to design an application himself that would allow users to make their personal collections of mp3 files available without having to post them to the web, and to peek directly into others’ collections, searching by song title or band name rather than from site to site. And, though the application he designed was first posted online in July 1999, its popularity didn’t spike until 2000, after the lawsuit brought by the RIAA drew the attention of the press, and with it a massive population of eager users and their music.

It is important to understand how Napster and peer-to-peer applications actually work, if only because they have been somewhat caricatured in the subsequent argument for technical copy protection. While trading copyrighted music may not be a bold, political act, the cultural potential of the peer-to-peer architecture does pose a more conceptual challenge to the ways in which we commonly distribute information. Napster was not just an economic threat to the corporations that traffic in culture, it was an ideological challenge to the very legal and economic principles on which
they depend, and it did make plain some of the limitations of that system (however crudely those limitations were then exploited).

Amid all the excitement for the peer-to-peer phenomenon,75 stirred by supporters and detractors alike, it was easy to misrepresent it as a dramatic new innovation. The gleam of the new can be a powerful tool for anyone debating the impact of a technology—change is a more compelling call-to-arms than continuity, regardless of whether it is benevolent or disastrous. The applications that appeared and proliferated alongside Napster were not new; they merely expanded on the architecture of the Internet, building on the same logic as a host of applications that preceded them,76 and drawing on models of information distribution with a long, if often marginalized, history. The more important story here is one of continuity; the link between these tools and a longer tradition of how culture moves is too often lost in the debates about their legality—in many cases, deliberately. That said, there are two features of peer-to-peer tools that are, if not radically innovative, then at least worth noting, because they reveal how the design of these tools invokes alternative traditions for how information can be distributed. In his expert testimony in the Napster case (where he carefully described Napster as an “evolution in Internet technologies”) Lessig noted, “Neither of these two components alone represents a radical advance in Internet technology . . . but Napster does combine these two functionalities in an innovative way.”77

The first is that, unlike Internet applications like the web browser, peer-to-peer tools allow the user to be both client and server simultaneously. When you logged onto the Napster network by getting online and running the program, you joined a large group of current Napster users. You could request files from a designated folder on their hard drives, and other users could request files they found in yours. Napster helped negotiate the protocols so that one user could provide the requested file directly to the other. No intervening server was necessary for the actual exchange to be made.

While the Internet opens up access and participation much more widely than more centralized systems—many-to-many rather than one-to-many or few-to-many—it has never actually been an all-to-all communication network. The web retains a distribution hierarchy in the distinction between client and server. Individual computer users—clients—can request files from servers (surfing the web); they can provide specific kinds of information when asked (filling out an online form, adding to an online shopping cart); they can provide their files via certain servers under certain conditions (posting a website, contributing to a newsgroup); and they can send specific files to known addresses (e-mail, file transfer). But they could not, until Napster, automatically field requests from users for files stored on their computer. Being a server requires special (and somewhat less user-friendly) software applications, as well as the resources to effectively field requests (a fast and reliable connection, a terminal that’s on and connected all the time, protection against hackers and viruses, etc.). These special conditions mean that, although anyone with a computer and the requisite skills can be connected to the Internet, only a subset of those people can actually be two-way information providers in the fullest sense. The rest have only limited means to provide information to others, and are beholden to service providers for the wide distribution of their documents.78

The promise that the Internet “revolution” would allow anyone to be a multimedia producer, and would erase the barriers to cultural expression posed by centralized authority, was not so much wrong as it was overstated. The dynamics of production and consumption are always tied to the particular politics of how information is distributed, and the Internet as a system of information distribution has a particular political character. While the Netizen rhetoric tended to emphasize free and equal access to the network, a system of control, dispersed and fractured but not evaporated, remained in place; the power relationship in the client-server relationship is parallel to the traditional distinction between information providers and information recipients. This nodal design is not inconsequential; gaining space on a server and thus visibility on the Internet costs money and resources, and is limited by time, server space, and the rules of use that webmasters establish. Most important, this system can be exploited; the way the RIAA pressured universities in their role as providers of Internet service into policing their users, for example, reveals how this client-server relationship can be used to reassert control over the many by the few. The experience for a user of being both client and server simultaneously, then, is significantly different from, say, browsing the web.79

The second of Napster’s important innovations helped make this breadth of information distribution more feasible. Peer-to-peer applications include a way to search for a particular file across a constantly fluctuating network of users in real time. The system can accommodate users logging on and off the network at their whim, and the files they offer changing from moment to moment. Napster did this by storing a regularly updated list of files made available by all users currently logged on. A request for a specific file would be sent to Napster’s server; Napster’s server delivered a list of files currently available from logged-on users, including their IP addresses (although they are invisible to the user); selecting a file initiated
a direct file transfer. Logging off Napster removed your files from the central list; a search request “pinged” users to see if they were still available to the network. The fact that this search function was centralized made Napster more efficient than some competing peer-to-peer applications, but also made it easier to control; this technical choice made Napster both the most popular of the file-trading tools and the most obvious target of an RIAA legal challenge.

A more decentralized model, used by Gnutella and others, depended instead on a series of requests spreading from the user to others, in a branching tree pattern. A user requested a file; that request was sent to a few users; each user sent it to a few more; and each of those sent it to a few more, and so on. If anyone who received the request had the requested file, they responded to the initial user and a download began. This made Gnutella less susceptible to legal challenge, since there was no central server to shut down. But it also posed a problem of scalability as the service grew; the more people connected, the more of these requests were propagating across the Internet, increasing traffic and slowing responses. Regardless of the drawbacks, the ability to search in real time allows peer-to-peer applications to enjoy the benefits of decentralization—lack of control, wide range of voices and texts, easy access, cheap distribution—while minimizing some of the disadvantages in terms of the organization and availability that usually follow.69

These innovations, regardless of whether we characterize them as mass-transformative or historically continuous, mark peer-to-peer applications as a different way of structuring and exploiting the Internet—a difference that is not only material, but symbolic. Together they organize users and materials in ways particular to a decentralized network, but they have also come to symbolize the system's value and purpose: a cultural politics of decentralization. Peer-to-peer applications, like the Internet itself but to a greater degree, can shift the power of distribution into the hands of a much wider population of users than can traditional media systems. They pose a conceptual challenge to our ideas about how information should be produced, organized, distributed, and consumed—and most important, by whom—and to the economic actors whose business models depend on being the exclusive distributors of information to a dependent public.

In everyday practice, technologies can never be separated from social claims of their purpose, significance, and value. Public debates about peer-to-peer applications invoked these technological features as proof of the cultural agendas they purportedly represent: when the software was redesigned, it was improved not only technically, but also to better embody a political stance or fulfill a legal obligation; designers explained those changes by invoking claims about the technology's social impact. Thus the record industry faced not only a new system for the unauthorized circulation of their work but also a nascent political movement that justified file-sharing in terms of new models of the distribution of culture, with a vocabulary of technologies that seemed to support them.

Killing Napster

In December 1999, only five months after the first version of the Napster application was posted online, eighteen of the largest record labels brought suit against the company in Northern California U.S. District Court. They alleged that Napster was guilty of promoting the unauthorized distribution of their copyrighted music recordings, and sought an injunction and damages on the order of $100,000 per copyrighted recording infringed. Separate suits from Metallica, Dr. Dre, and independent label TVT Records followed. Napster came under an attack that was at once legal and discursive—an effort to shut it down, to squelch the commercial and legal aspirations of peer-to-peer, and to stabilize what counts as authorized and unauthorized, legal and illegal, and ethical and unethical distribution of cultural expression. Copyright's presumption that authored work is best distributed as a purchasable commodity would be put to the test, against not only the individual pleasure of getting something for free, but also the powerful counterideologies being articulated around Napster and peer-to-peer: freedom of information, the value of the public domain, the corruption of the music industry, the rights of fans, and the significance of culture.

The initial complaint attempted to articulate a natural alliance between the principles of copyright, our hopes for technology, and the interests of the record industry. Notice how the RIAA tries to take back the promise of the Internet from peer-to-peer boosters, although with an implicitly different future in mind for it. “Napster has thus misused and is misusing the remarkable potential of the Internet, essentially running an online bazaar devoted to the pirating of music.”68 The “remarkable potential” they refer to is, of course, not the vibrant public forum prophesied by the Netzizens, but the digital marketplace that both the record labels and the Clinton-Gore administration imagined. The RIAA also began the work of demonizing Napster as a threat (and a particularly deliberate, snide, adolescent one) to culture as they understood it—which, of course, it was.
Napster’s defense depended primarily on the 1984 *Sony v. Universal* “Betamax” case, in which the film industry similarly targeted a technology that it claimed encouraged copyright violation and undercut the legitimate market for cultural work: in that case, the VCR. They sued Sony for contributing to and financially benefiting from copyright infringement, hoping to either shut down the market for the new device or compel Sony to work with them to better protect their copyrights. The court narrowly decided that the VCR, while it could be used to copy copyrighted movies, was also useful for other purposes—for instance, what Sony had termed “time-shifting” (the practice of taping a television program to watch later). Because the device was “capable of substantial non-infringing uses,” the courts decided it could not be held liable for when users did use it to violate copyright. Napster similarly argued that, because users could trade non-copyrighted music just as easily as they could copyrighted material, and could “space-shift” their own music rather than carrying around CDs, Napster also had noninfringing uses.\(^2\)

In July 2000, Judge Marilyn Patel granted the RIAA the injunction it had requested, ordering Napster to find a way to prevent the circulation of copyrighted music through its service. Considering the circumstances, it was probably the judicious thing to do—if we are reflexive about exactly what we mean by “justice” when we say justice was served. Napster users were directly infringing the copyrights of the major labels, Napster was facilitating their behavior and would eventually gain from it financially. As such, they should be found liable for contributing to copyright infringement. Justice here is a finding that fits with and confirms existing legal doctrine and judicial precedent: in terms of the specifically legal vision of the situation, Napster is liable. In terms of the *Sony* defense, Napster was arguably being used overwhelmingly for copyright violation; more important, although the court agreed that some uses of the system might be “fair,” this was irrelevant because Napster could prevent infringing uses in a way that Sony could not.

What this overlooks, of course, is whether the existing copyright law could accommodate, or even comprehend, how different the arrangements of distribution offered by peer-to-peer networks were, in comparison to traditional material and commercial means. What was at stake here was a powerful paradigm, a commercial system of distribution based on a powerful confluence of legal and economic values, facing an alternative paradigm that worked on substantially different terms. It was the same challenge posed by early peer-to-peer boosters: that the very hierarchy of provider/consumer would be replaced with something like a network of peers. People would trade cultural expression rather than purchase it, would see it in terms of experiential and social value rather than exclusively in the commercial terms that have come to stand in for those values.\(^3\) If price is treated as the ultimate marker of value, then free goods are worthless; but in the absence of price, the industry feared that their consumers would come to recognize other forms of value, ones that could not be translated into dollars, or didn’t need to be. Copyright law, however, is both premised on and the basis of the commercial logic being challenged, and does not have much space to accommodate this alternative paradigm.

Napster died an ignominious death in 2001, after some legal wrangling with the RIAA about how to comply with the court’s decision, a dramatic drop in users once the copyrighted music became largely unavailable, and a surprising last-minute influx of capital from music giant Bertelsmann, who broke ranks with its RIAA partners in the hope of transforming Napster into a legitimate music platform. However, a series of peer-to-peer alternatives emerged in its wake, each one designed specifically to avoid the kind of legal threats the RIAA could impose: a more decentralized architecture offering no point at which legal consequences can be imposed, and corporate headquarters located overseas where U.S. law cannot reach. Networks such as Morpheus and Kazaa rapidly exceeded the user base enjoyed by Napster even at the height of its popularity, and file-trading has become commonplace for music fans, especially with younger generations for whom digital music is not a novelty, but the only format they’ve ever known.

The major music and film companies continued to seek lawsuits against these technologies, most recently in *MGM v. Grokster*.\(^4\) The industry was shocked when the appeals court found in favor of the peer-to-peer companies, under the same *Sony* defense Napster had attempted to use, and appealed to the Supreme Court. Many guessed that their decision would not only signal the fate of peer-to-peer technology, but would also finally clarify how the *Sony* defense should translate to the digital realm. In 2005, the Supreme Court found for the entertainment industries, but added an unexpected twist. The court could not agree on how the *Sony* standard applied. They did agree that defendants Kazaa and Morpheus should be held liable for facilitating copyright infringement, but according to a new standard: not only whether they knew of and materially aided the infringement of their users, but also whether they had actively encouraged users to violate copyright. The court pointed to how the two companies had marketed their services, the deliberate absence of technological features designed to prevent infringement, internal e-mail and corporate
documents that revealed their intentions, even the fact that the name "Grokker" was meant to remind users of Napster. This "inducement" standard, similar to the "Inducing Infringement of Copyrights Act" proposed by the Senate the previous year, now stands beside (or perhaps against) the Sony "substantial noninfringing uses" standard in determining how digital distribution technologies will fare in copyright liability cases.

For the biggest distributors in the music and film industries in particular, the threat of widespread copyright infringement posed by Napster, Grokker, and peer-to-peer tools appears to be a real and substantial danger. Putting aside for the moment whether they're correct, and whether this view may also be opportunistic, file-sharing is perceived to be undermining the very foundation of the music business. Songs are certainly being downloaded by potential customers at a bewildering rate, and traditional CD sales are taking a dive that has coincided with the rise of networks, although evidence of a causal link is inconclusive.\textsuperscript{85} But the record labels are even more frightened by the possibility that whole generations will come to perceive music as a free resource. Not only would sales be lost today, but the very idea that music must be bought might also vanish. As Richard Parsons, president of Time Warner, warned, "It's a reality. An increasing number of young people don't buy albums, so we are not only losing that immediate revenue. They are also growing up with a notion that music is free and ought to be free."\textsuperscript{86}

Napster and peer-to-peer file-trading provided the necessary justification for the entertainment industries to declare war: the court's decision in the Napster case was a portent of that war's future. While music and film industries have continued to pursue the legal avenue of suing both individuals and the institutions and technologies that aid them, they have increasingly turned toward technological solutions in the hope that the clean intervention of technology might succeed where the messier mechanisms of the law have not.

**Digital Rights Management and the "Trusted System"**

Just as digital technology seems to facilitate the reproduction and distribution of cultural work, it also facilitates new forms of technological intervention that are more specific, flexible, and invisible. Even as they slowly began to seek new ways to deliver content, the major music labels and Hollywood studios were also seeking technological roadblocks to the easy redistribution of intellectual property, should the legal ones fail. What they want is something more vast than just stronger statutes, copy protection systems, and watermarks; they are slowly building the material infrastructure and digital standards, as well as the social, commercial, and legal preconditions, for the rise of "digital rights management."\textsuperscript{87} DRM is an umbrella term for a family of technical applications, and for the legal and commercial arrangements they require. Some are already being experimented with and used; others are mere proposals being considered and researched.

Most DRM systems begin with the kind of copy protection already commonplace in the sale of software and the delivery of television through cable and satellite, which depends on the use of encryption. Encryption is a security technique that takes advantage of the ease with which information, stored digitally, can be mathematically altered (but not destroyed) according to complex algorithms. With a key that precisely reverses the mathematical distortions, the original data can be retrieved; without the key, the data is meaningless. Once a technique used almost exclusively for sending secret messages, primarily for military or criminal purposes, encryption has been incorporated into the commercial distribution of information in order to distribute work widely and yet ensure that only authorized users can access it. The key to a particular encryption algorithm may be built into a device (cable television is scrambled according to an algorithm whose key is built into the decoder cable box given to subscribers); it may also be delivered along with the content and triggered by a particular piece of information possessed by the receiver (some software applications can only be accessed by entering a password, serial number, etc., which the consumer receives at the moment of purchase or after subsequent registration); it may also be delivered separately, triggered only when the work is used in a particular way.\textsuperscript{88} Content providers may have only a single key that all consumers will use, may deploy a range of keys so as to distinguish different devices or contexts in which they can be used, or may even assign a single key to each and every user or each and every device.\textsuperscript{89}

Such encryption schemes have been experimented with by the culture industries for nearly three decades, and often serve well as a "curb-high"\textsuperscript{90} protection by discouraging casual infringers. But taken by themselves they are insufficient for the kind of airtight copyright protection to which many producers aspire. Encryption schemes can be cracked and circumvented, inasmuch as any system built can be unbuilt. Most important, encryption does not actually prevent copying. While these systems may stop unauthorized users (i.e., a television viewer without the requisite cable box cannot access the encrypted signal), encryption by itself cannot prevent
authorized users from making unauthorized copies, nor can it prevent unauthorized users from making exact copies of the encrypted data.

So, increasingly, these encryption schemes are being paired with a second level of control, in which the receiving device not only decodes the encrypted content, but also obeys a series of rules about the content's subsequent reproduction and redistribution of it, ensuring that such functions are made impossible for the average user. This set of arrangements, sometimes called a "trusted system" or "trusted computing," greatly expands the complexity of DRM, but offers copyright owners at least the promise of a great deal more, and more precise, control.

Imagine that your stereo is a small, handheld device. It stores, organizes, and plays songs you have purchased in digital form. (Perhaps it is an all-purpose media device: DVD and mp3 player, e-book display, cell phone, wireless web browser, PDA, portable game console, everything but the virtual kitchen sink.) It interfaces with your home entertainment system to play music through your expensive speakers, snaps into your dashboard to play in your car, and pumps tunes through your titanium headphones. To purchase music, you link it to your personal computer to download from your favorite website, or to a kiosk at the mall, or even to a friend's player. This device would offer the ultimate in convenience, audio fidelity... and digital commerce.

The "trusted" part of this system is that this device obeys rules established by the copyright owner when they first make the song available—the "digital rights." These policies can be built into the device itself, embedded along with the delivered file, or sent separately by a licensing authority (typically, the producer of the content) whenever the user initiates a function that requires authorization. In one model the music is encrypted, and the digital file is marked with tags that indicate not only its title and artist and such, but also its legal owner, its fee to play or to transfer, its duration of usability, and the account to which fees are to be paid. These tags can provide almost any kind of information, including any kind of rearticulated copyright specifications; they can also be flexibly redesigned as producers come up with new ways to carve up the distribution and use of their product. Trusted devices would "precisely interpret" these digital tags and act accordingly.

Let me quote at length the description of one such system. The comments toward the end of the passage come from George Friedman, CEO of InfraWorks, and one-time intelligence and security expert for the U.S. military during Operation Desert Storm:

The InTether system consists of a packager, used by the originator of a file, and a receiver, used by the recipient. The packager enables a publisher, record label, movie studio—or, for that matter, a law firm, doctor's office, bank or anyone else who wants information security—to impose a set of restrictions on almost any digital file...

Using the packaging software, the originator can determine how many times the recipient can view or play the file; whether the recipient can alter it and send it to others; the identity of permissible recipients (determined by IP numbers and passwords); whether the file can be printed freely, once, or never; how long the file can be viewed or played (in hours and minutes); the date on which the file can first be opened; and the date on which, if the originator wishes, the file will self-destruct and vanish from the recipient's hard drive...

...From the perspective of the user, the InfraWorks software is almost invisible, except that when viewing or playing an InTethered document the consumer will not be able to use certain commands—typically, the "copy," "print," "cut," "paste" and "save as" commands.

...The receiver is anchored to the C drive, where it cannot be moved or copied, and it is "cloaked" to render it invisible to the Windows operating system.... Although the InTether system does involve cryptography—inTethered files are encrypted, and the receiver contains the key to decrypt them—the receiver does much more than that. It places "system-level controls on what you can do that are persistent," Friedman says, effectively overriding the operating system....

"We're fairly deep in the operating system," he says, "so we see what's going on and we either permit or deny it from happening in relation... to the files under our control." The rhetoric is classic command-and-control, a far cry from the delicate balance of copyright; it should come as no surprise that the design of this technology has been developed by military security experts. The device, and the entire system, aspires to be a "black box" in the way Bruno Latour intended: The "assembly of disorderly and unreliable allies is thus slowly turned into something that closely resembles an organized whole... It is made up of many more parts and it is handled by a much more complex commercial network, but it acts as one piece." The user would, ideally, be completely unaware of, and completely regulated by, this system.

A number of restrictions are likely to be common to all DRM-based trusted systems. First and foremost, the device must in some way forbid unregulated copying—and not only duplication inside of that device, but also the output of the data in any form that could then be recorded by an attached device. Devices would refuse to output to other devices that were not compliant with these protocols and rules, that were deemed "untrustworthy." You try to load the file from computer to stereo,
or stereo to computer, but your request is rejected, the copy function disabled.

This, Lessig argues, is a fundamentally different way to enforce law: "What copyright seeks to do using the threat of law and the push of norms, trusted systems do through the code. Copyright orders others to respect the rights of the copyright holder before using his property. Trusted systems give access only if rights are respected in the first place." Such a system would not require a monolithic system of authority to oversee the production of every device; it would, like the Internet, depend only on shared or translatable protocols, so that a network of networks could function as a system and together ensure that the rules are comprehensive and inviolate.

This raises the question, of course, of how a cable box, DVD player, or computer can know what an attached device is capable of. One solution is to restrict the kinds of formats in which a signal may be delivered: the DVD player could output in analog (i.e., to a TV) but not in digital format (i.e., to a computer, which would presumably make it more vulnerable to unauthorized duplication and distribution). In more ambitious versions of the trusted system plan, all devices that handle digital information of any kind would either honor the rules embedded in the trusted system, or have a compartmentalized portion of the device that does so. Inside a computer, this would mean that authorized applications could be loaded within a bounded set of trusted processes, only inside of which the digital work could be decrypted and manipulated. Then these applications and devices could interact freely, after a "handshake" assures the first device that the second device will honor the same copyright restrictions.

In a basic version of DRM, the fact that the material is encrypted could be the signal that indicates to a trusted device that the work should not be copied; or the work could be accompanied by a simple "copy/do not copy" mark. But, if such a trusted system could be established, in which all consumer hardware honored a set of matching copyright rules when dealing with materials protected by DRM encryption, then the particulars of these obligations could be designed in increasingly precise ways. Instructions to the trusted device could indicate that a work may only be copied a certain number of times, or under certain conditions, or for certain additional fees. Already, the popular online music services (iTunes, Napster 2, Pressplay, Rhapsody) limit the use of downloaded files by tethering each file to one or more computers, preventing users from burning songs to CD or changing their file format, and limiting how many portable devices the song can be ported to.

Some have suggested that trusted systems could eventually be matched up with a micropayment scheme, when a workable one is developed, such that fees are billed at the moment the user decides to play or copy a work, at prescribed costs and according to encoded arrangements. These arrangements could be included in the encoded instructions, and automatically obeyed by the trusted device. Each use of a file or transfer between trusted devices would accrue charges, which would find their way back to the copyright owner through an "always online" network. This system of exchange could extend well past the original point of sale. You might buy a copy of a song from me, the fee returning to the copyright holder; or you might pay a smaller fee to "borrow" it from me, at which point the copy on my device would be disabled temporarily as long as you "had" it. Sales could be for a limited duration, an extended music rental, or for a set number of plays; the device could erase the song after the authorized period, unless you agreed to pay more. The "accountant inside" would log all sales and transfers, and accumulate them into a monthly bill payable to the content owner. With such a system in place, "digital property can be anywhere on the planet without the knowledge of its creators and still make money for them whenever it is used or copied." As long as the interconnected system of devices that handle the digital content and its accompanying instructions were all designed to comprehend and obey the same instructional language, these copyright rules could be infinitely and precisely specified for uses, conditions, and even different users.

The trusted system, though regularly justified as a specific response to the threat of online copyright infringement, is much more. It allows for an incredibly subtle and complex parsed of the use of information so as to be sold; and it provides a tool that will act as clerk, distributor, broker, police, and judge, all in one. Geoffrey Nunberg has remarked how commercial industries, looking to best transform culture into commodity, often work toward the greater "morselization" of culture: the flow of ideas and expression is endlessly subdivided into discrete portions—books, chapters, albums, singles, movies, clips, sequences—so that they may be monetized in various ways for individual purchases. This, he argues, is not a cultural logic, but rather a strictly commercial one: it is not what is best for public discourse, but for the market. The trusted system is a morselizer of unprecedented depth; it can divide the same materials into all manner of discrete packages (song, album, sample, playlist, number of listens, time period), offering multiple forms of commercial transaction to suit the liking of the user and the precise price discrimination between users.
All of these forms move us closer to a “pay-per-view society,” where digital technology offers ever more subtle and specific means of commodifying every bit of expression, and every practice involved with it. According to Vincent Mosco, “Though information has been a commodity from the earliest days of capitalism, the new technology deepens and extends opportunities for selling information by transcending the boundaries that space and time impose on the packaging and repackaging of information in a marketable form.” A more recent embrace of a subscription-based model by Napster 2 and its major label partners may signal a move away from the more classically pay-per-arrangement adopted by iTunes in its à la carte pricing, and there is an argument to be made that these particular pricing models urge different kinds of consumption practices and different orientations towards culture. For the moment, the fact that we have both subscription-based and pay-per-arrangements only supports Nunberg’s notion that culture is being further morselized—not only in more precise ways, but along multiple and overlapping dimensions. To the extent that such commercial arrangements can, in certain cases, offer economically equitable services to more people, they may have some benefit; however, when a pay-per-view arrangement is pursued solely for its commercial value and efficiency, and other cultural needs are overlooked, we risk leaving to the market precisely those aspects of public life we already know are badly served by it.

It is worth noting that my description thus far has focused exclusively on the use of DRM for entertainment media, and will continue to do so. There are a number of reasons for this. First, the major U.S. music and film industries have been the most active and visible proponents of DRM arrangements, and the technologists experimenting with DRM techniques are doing so largely on their behalf, or at least with the recognition that entertainment is the most obvious and lucrative use of their tools. Second, it is the media companies that have been most successful in shifting the debate about copyright and framing technological solutions as an imperative. But the questions about DRM as a tactic are not exclusive to entertainment. DRM encryption techniques are increasingly being used in the circulation of all types of digital information, from satellite maps to distance learning materials to preservation archives to intracorporate documents—anywhere that someone wants to retain control over what users do with their information. The same tools being designed for the sale of movies online can easily be fitted to the protection of any digital content, and for whatever end the owner of that information desires, be it copy-

right protection or otherwise. In some ways, how we implement technical copy protections on pop music will have ramifications for how we circulate information more broadly—just as the interests of entertainment providers have long directed the shape and interpretation of copyright law, though the law applies to information of all kinds.

Fair Use in an Encrypted World

Most of the commercial distributors of media content have looked eagerly to DRM encryption and the trusted system, both as the answer to their fears of piracy and as a new mechanism for commodifying their goods in unprecedented ways. And some scholars agree that DRM is the most promising solution to the problem of managing copyright on digital networks, perhaps the only viable choice. But others have taken DRM to task for altering the character and consequence of copyright. Most prominent among them is Lessig, who notes that while the “West Coast code” of software is quite similar to the “East Coast code” of law in that both can be used to regulate human activity, they differ in how they regulate in important ways. These differences have material, economic, cultural, and, most important, democratic consequences.

Part of the problem is where decisions are made as to which rules are built into technological systems, how they are built in, and to what ends. The law, at least in principle, is the product of public deliberation by elected representatives. The goals pursued are supposed to be those of the public interest, the health of the nation and its economy, and the aspirations of the Constitution and American democracy as understood in the modern context. Of course, whether these goals are regularly achieved or even pursued is a separate question. As Jessica Litman has noted, copyright laws have historically been written by a conference of representatives from “relevant” or “aggrieved” organizations, which has overwhelmingly meant commercial publishers and producers. Still, the public interest remains the principle according to which the law is written and adjudicated. The regulations in code, on the other hand, are designed inside of private, typically corporate contexts. There is no guarantee, indeed no expectation, that these rules will be designed in any way other than in the designer’s best interests. Even private law in the form of contracts must remain beholden to the public; as Lessig describes it, “Private law creates private rights to the extent that these private rights serve some collective good. If a private right is harmful to a collective good, then the state has no reason
to create it. The state's interests are general, not particular. 108 Technological code designed outside of this system is under no such obligation.

Joel Reidenberg points to the increasingly central role of standard-setting organizations as warranting similar concern: "The shift in focus toward technical standards as a source of policy rules emphasizes technical fora whose institutions are not normally associated with governance. The Internet Engineering Task Force, the Internet Society, the World Wide Web Consortium, and traditional standards organizations like ISO, ETSI, and committees like T1 are the real political centers. 109 These consortia are often not strictly governmental organizations, and are often populated by representatives from relevant industries. But at least these coalitions attempt to represent multiple interests, even if they are all one sort of interest and not another. The kind of private organization Lessig worries about is not an IETF, but a Microsoft. In their software development, they end up setting many of the ground rules for how computing will occur in a variety of places. Their market dominance 110 allows them to set standards that have implications for a majority of computer users, because their standards are likely to be built into third party applications and systems so as to be interoperable with Microsoft's platform. The threat Microsoft made in the late days of the Napster dispute—that they might redesign their Windows Media Player (an application built into their Windows OS and widely used) so it would artificially degrade the sound quality of mp3 files—revealed the kind of power they have to technologically regulate behavior in systemic ways. 111

Lessig's concern is that the code designed by private corporations will be designed according to private agendas. While Congress is supposed to serve the public interests and the existing laws of the land, Microsoft and other corporations serve the interests of the consumer—specifically their consumers, and specifically in ways that serve the interests of their investors—bound only by the pursuit of continued profit and the dynamics of the market. These, Lessig worries, are far from ideal priorities, since standards can have consequences for a wide range of human activity: commercial, organizational, political, expressive, creative. A trusted system takes this to an extreme. As Mark Stefik argues, in a trusted system the copyright owners could determine the rights they wanted assigned to their particular work, creating a kind of "shrink-wrap license" specific to each work and each user. The nature of these assigned and restricted rights, and even the categories of rights, would be determined in the private and commercial contexts of the publishing house, movie studio, and record label, rather than on the floor of Congress, and in these private companies' interests, rather than the public's. "Trusted systems give the producer maximum control—admittedly at a cheaper cost, thus permitting many more authors to publish. But they give authors more control (either to charge for or limit use) in an area where the law gave less than perfect control. 112"

The most obvious way in which privatized technical copy protection can distort the subtle balance built into copyright law is with fair use. As noted previously, fair use was designed to allow some breathing room for the reuse or redistribution of copyrighted work that would otherwise be considered infringement. The exception applies when the use serves a valuable social purpose—quotation, classroom copies, criticism, journalism, parody. This exception was designed to be purposefully ambiguous and context-dependent. The four factors to be weighed in each case are vague, and the law refuses to indicate exactly how they should be applied. Fair use leaves to the discretion of a judge the task of determining how a particular use of someone's work is affecting its market, to what use it is being put, etc. This gives judges leeway in protecting users against the restrictions copyright owners might hope to impose, building in a grey area where users can dare to experiment and copyright owners may choose not to litigate. 113

Whether it is a deliberate strategy or simply the function of limited resources in the face of nearly infinite possibilities, law typically does not specify exact regulations for every possible behavior in every possible context. Instead, the law attempts to articulate a broad regulatory principle, accounting only for the most obvious factors and the most likely conditions; subsequent decisions in the courtroom apply the law to specific circumstances; those decisions become precedents, enriching the law for the next dispute. Determining when fair use is applicable is a messy business, best left to judges who can consider the character of the works and the context of the use.

This ambiguity is a positive feature, not a failing. When we engage in a specific behavior, we make an educated guess as to whether it is legal or not—some seem very likely so, like ordering dinner at a restaurant; others are very likely not, like shooting someone in the head. (Even in these simple cases there is ambiguity in both the moral context and in the law itself: ordering dinner while your child is choking might be deprived indifference, while shooting someone in the head as they are attacking you might be self-defense—and each of these general exceptions themselves come with their own murky edges.) Between such extremes there are activities that may or may not be legal, depending on an interpretation of the law. Those practices that are not neatly described in the explicit language
of the law and have not yet come up in court, which means almost all of them remain in an ambiguous but productive purgatory between legality and criminality. This grey area is expanded by the fact that copyright owners often overlook some practices that they either do not see at all, see as possibly beneficial, worry might be bad publicity to attack, or simply see as not worth the financial cost of pursuing. Private copying and trading music among friends have long fallen into these categories.

As Cohen notes, there may be real cultural and democratic value in this grey area: “One could also conceive the noncommercial ‘breathing space’ the current system allows for citizens for browsing, public domain use, and fair use to be a public good worth preserving—notwithstanding the fact that most consumers do not plan to reverse engineer software or publish a parody or critical essay directed at a literary work and would see no need to bargain in the market for the right to do so.” This “noncommercial breathing space” has allowed for, among other things, ingenious uses of content that the original owners did not anticipate or foresee as commercially valuable (e.g., sampling in hip-hop music), the possibility of unexpected technological innovation (the VCR, the web browser, Napster, etc.), and the development of informal networks of culture sharing that, while perhaps qualifying as infringement in technical terms, arguably also serve a wide, robust public discourse.

To code such rules into a technological device or software application, on the other hand, would require much more precise rules than the law provides, and the resulting system would be fundamentally less capable of judging ambiguous and contextual situations than a human. Even if we wanted to develop a DRM system that does allow for fair uses, how would we encode the same ambiguity that is encoded in the law? While a trusted system would be more precise in exacting fees along finer and finer distinctions, it could never assess the intent of its users or the consequences of use. Edward Felten has noted that this ambiguity and flexibility is nearly anathema to computer scientists, who necessarily design mathematically precise tools: “The legal definition of fair use is, by computer scientists’ standards, maddeningly vague. No enumeration of fair uses is provided. There is not even a precise algorithm for deciding whether a particular use is fair...” To a computer scientist, such imprecision is a bug; to lawyers it is a feature, since it allows judges to take into account the unique circumstances of each case... The vagueness of the fair use test makes it essentially impossible to create a DRM system that allows all fair uses.”

In a DRM system, “only those policies that can be reliably reduced to yes/no decisions can be automated successfully.”

This is not just a question of the different mindsets of lawmakers and programmers. Technological systems, unlike laws, are designed to fully iterate every possible activity. They do not do so by anticipating each possible action in each possible context. Instead, they articulate all the categories of possibility such that activity can only happen within those discursive boundaries, they describe a series of available actions within each category such that activity becomes choices from a preset menu, and they set a default action for anything that does not fall within the anticipated parameters. No activity goes unnoticed, since the technology is present at every encounter. Within this system, there is no room left for ambiguously permissible behavior—every use is either allowed or refused, free or priced, at the moment it is attempted, with no exceptions.

As Lessig puts it, we are then faced with a choice: “The architectures of property will change; they will allow for greater protection for intellectual property than real-space architectures allowed; and this greater protection will force a choice on us that we do not need to make in real space. Should the architecture allow perfect control of intellectual property, or should we build into the architecture an incompleteness that guarantees a certain aspect of public use? Or a certain space for individual freedom?” And if a device cannot distinguish between copying that is fair and copying that is infringement, the worldview of copy protection is better safe than sorry. Were someone interested in making a traditional fair use of the work—using a clip in a satirical montage, or in an online news report—it is not clear how such a system could allow it, if allowing that also meant allowing analogous uses that were infringing.

Because fair use is so antithetical to the design of technologically enforced rules, some worry that it will simply be discarded. The Napster filter could not tell what you intended to do with the song you downloaded, so it simply prevented the song from being downloaded at all. It could not distinguish between pirates and parodists and professors, so it restricted all equally. We have judges because we know the case will always be more complex than a law can anticipate, and we count on their judgment. Instead of using law’s ex post assessment of intent and consequence, technology prepares for the worst and lives by it: Every unauthorized use is the first open door to a swelling wave of piracy; every tool is an epidemic.

Perhaps, though fair use might shrink, use more generally might actually grow. Some have argued that digital tools might facilitate the simple and affordable licensing of routine uses in ways that could not be managed before. Digital databases would make it easier to find and negotiate with
owners, and easier for owners to establish collective licensing organizations; even more, DRM would allow these licenses to be automatically achieved: it could provide, for instance, a pop-up window that offers, "For another 25 cents, you can clip and save ten still images." Tom Bell, calling this "fared use," suggests that an array of new and beneficial licensing arrangements simply await exploration: "As copyright owners and consumers contract around the default rules for fared use, they will experiment with a wide variety of methods for managing information in the digital intermedia. A full assessment of this exploratory and entrepreneurial process must await our observations of actual results. We can assume, however, that copyright owners and consumers will modify fared use's reciprocal quasi-compulsory license only when they find it mutually beneficial to do so."¹¹⁹ Such a system would be flexible, not only in charging micropayments for use, but in charging differently for different kinds of use: "usage rights could provide for different kinds of uses and fees, distinguishing between copying rights, loan rights, transfer rights, play rights, broadcast rights, print rights, extract rights, embed rights, editing rights, and several others."¹²⁰ Within this paradigm, DRM represents for some the long-awaited renovation of an imperfect system: Until now, it was not feasible for the law to intervene at every moment in an appropriate way.

There are, however, some problems with this notion. Unless the federal government intervenes to ensure that DRM accommodates fair use, it will rarely be included voluntarily. "Privately negotiated DRM mandates are unlikely to accommodate fair uses, and once industry groups have agreed upon a DRM standard, the public will have little leverage for demanding fair use accommodations."¹²¹ What incentive does a content provider have to choose a DRM system that allows for the transformative use of their work? Presumably, they would only incorporate such options if there were a likely economic benefit—that is, only if those who could pay for it will pay, and only if they can anticipate the value of untested uses. "Fared use" prefers established users (entertainment companies, private libraries, established academics) and the uses they would likely make, while those who cannot afford such licensing fees will either not be granted the right, or will be unable to pay for it. This would tip the scales of creativity toward established institutions and away from amateur, homegrown production, privileging Time Warner's musical innovations over the innovations grown on the streets of the Bronx.

Further, not transformative fair use accommodations may be easier to encode than transformative ones. Time-shifting the movie you recorded may make the cut, as it is technically simple to both discern and allow, and economically more desirable to producers: cutting-and-pasting may be harder to code for and less appealing to content owners. If nontransformative fair uses are the only ones that can be built in, they are the only ones that will be available, and over time they may come to replace the richer set of possibilities users now enjoy.¹²² The question of whether there is a public interest in ensuring a right to make transformative use would essentially be deleted.

Finally, part of the premise of fair use was that such uses should not require asking permission of the owner. Ensuring the free speech rights of the reuser requires making use free not only in terms of financial compensation but also in terms of the freedom from having to ask for the right to speak, or even to alert an owner beforehand that the (potentially critical) speech is on its way. The Supreme Court has gone so far as to note that even asking for permission and being denied should not affect a fair use defense; fair use should apply even when the owner has explicitly said the use would not be allowed.¹²³ An automated licensing mechanism may make some reuses more affordable, but it also subjects all use to a permission regime that runs counter to the notion of fair use as a First Amendment safety valve for copyright.

What is clear is that, in the translation of law into the technical code of circuitry and software, the subtle dynamics of the rules are bound to change. We must take great care with this translation—we may lose more than we gain, or find that some kinds of authors and some kinds of authorship are more constrained than others. A more precise regime of control may not always be a better one. With the imperfections and potential abuses of any system of control, room for adjustment, even if it allows some illegal deeds to go unpunished or some distributions to go uncompensated, allows the system to stay healthier and be applied in a more just manner.

Most important, as this system is being designed by industries that currently enjoy a great deal of economic and political power, we must be skeptical of claims that this shift is for anything other than opportunistic reasons. The curious balance designed into copyright law, and the various caveats and limitations created to sustain that balance, were themselves the result of disputes like this, often spurred by the arrival of new technologies that seemed to offer new opportunities and new risks for the distribution of culture. But in the move toward a DRM version of copyright, we are witnessing not just the articulation of a new balance, but a radical reworking of the law and its implementation, based on a seductive retelling of the purposes for which copyright was intended.
There are real questions to be asked about copyright and DRM—how well the technology can substitute for the law, whose interests are best being served, and whose are being overlooked. However, there are bigger issues to tackle. And they begin with the recognition that a trusted system based on DRM encryption is just that: a system. It is more than just the technologies themselves. When we begin to discuss the political consequences of technological content protection for copyright and communication, we must be aware that we’re really referring to a complex array of elements—some technical, some human, some legal, some institutional—that together produce a matrix of restrictions and guidelines shaping what can be done with digital culture. This is an important insight for analyzing the DRM technologies that this system deploys and how they really regulate people’s activity. But it is also crucial to notice that the very process by which these elements are brought into alignment may have its own consequences, consequences that could occur whether DRM systems work or not, whether they are eventually embraced or not. To begin this analysis, we need to understand how technology works as a social phenomenon, and what we really mean when we say technology has consequences for social activity.

Much of why the debates around digital copyright remain so intractable is that our commonplace ideas about technology and its consequences are similarly polarized: either technologies change the world, or technologies are neutral. If the first is true, then the most radical predictions, utopian and nightmarish alike, can seem imperative enough to overwhelm more careful consideration. If the second is true, then we can “stop worrying and love the bomb,” overlooking the subtle ways in which the practices, policies, and expectations are changing around us. To fully investigate these disputes and their implications for digital culture requires more nuanced insights into the social embeddedness of technology, as well as an attention to how the political and social spaces from which technologies emerge shape their design and use.

Certainly, the effort to design technological fixes like DRM points to what sociologists of technology have been saying for some time: The material world regulates human activity, sometimes deliberately so. Human-made things are inserted into social contexts and organize both the practices that happen in and around them and the relations between the people involved. Walls and gates physically direct the movement of people who stand behind or pass through them. Prisons and asylums keep the inmates from the rest of the world and carefully choreograph their day-to-day lives. Industrial assembly lines draw people’s hands and eyes into a precisely choreographed dance with machines. Lenses and screens urge people to gather in front of them. Voting machines mediate the conversation between citizen and government, and ensure (or sometimes undermine) the reliability and credibility of that communication. Technologies shape their use; architecture choreographs what’s done amid it.

To return to Lessig, the way we design the manmade world in which we act means that “spaces have values. They express these values through the practices or lives that they enable or disable. Differently constituted spaces
2 The Copyright Balance and the Weight of DRM


3. U.S. Constitution, art. I, § 8, cl. 8. I will describe some of the fundamental elements of this law in a moment, but it is important to note that current copyright law is a deeply complicated affair whose myriad details cannot be explained here because of space constraints. For those who want a primer on copyright law as it stands, consult the U.S. Copyright Office's "Copyright Basics" (http://www.copyright.gov/circs/circ1.html). The current statutes are available at the "Legal Information Institute" of Cornell University's Law School (http://www.law.cornell.edu/topics/copyright.html). I will also not be dealing with copyright law outside the United States; though much of U.S. doctrine was built on the model of European laws, and many of the mechanisms are similar, especially after recent global treaties, the historical tradition and legal particulars of copyright elsewhere is significantly different than the U.S. model.


5. Ginsburg notes that there is some confusion as to whether the author's rights were considered by the framers of the Constitution to be subservient to the public benefit copyright was designed to offer, or of equal weight, or simply congruent in a way in which distinction between the two was simply unnecessary. Jane Ginsburg, "A Tale of Two Copyrights: Literary Property in Revolutionary France and America," *Tulane Law Review* 64 (1990): 991–1031.


10. Although Melville Nimmer, whose multivolume text is treated by scholars and jurists as the key reference for copyright law, does a phrase-by-phrase reading of the constitutional language, he does not speculate as to what the word "progress" means in this context. In discussing how "to promote the progress of science and useful arts," he suggests that the courts have chosen to accept this term in the most vague terms—encouraging all creativity, with the least governmental intervention regarding what kind of creativity, is in the best public interest. Melville Nimmer, *Nimmer on Copyright: A Treatise on the Law of Literary, Musical, and Artistic Property, and the Protection of Ideas* (1963; reprint, New York: M. Bender, 1983). For a consideration of what "progress" has meant in Western culture, see Robert Nisbet, *History of the Idea of Progress* (New Brunswick, NJ: Transaction Publishers, 1994).

11. This logic is almost the opposite of the "sweat of the brow" interpretation: Precisely because someone put effort into producing creative work, it should be made more available so that others do not waste their time duplicating that effort.


14. I do not intend to cite these as self-evident truths; they are homilies more than established facts. Critics in the sociology of science and technology have challenged the premise of the scientific principle, and asked whether scientists ever really follow its dictates; see Michael Mulkay and Nigel Gilbert, "Replication and Mere Replication," *Philosophy of the Social Sciences* 16.1 (1986): 21–37; and more generally, Harry Collins and Trevor Pinch, *The Golem: What You Should Know About Science*, 2nd ed. (Cambridge: Cambridge University Press, 1998). Economic theorists since Smith have questioned whether "perfect information" is possible, and whether it would "raise the market to some fair balance even if it existed. My point is that these platitudes are widely held to be true in principle, and each calls for the circulation of information and culture to be more open rather than less.


16. In fact, as Adrian Johns notes, the line between legitimate publisher and pirate is not a clean, obvious, or universal one; in the history of printing, publishers quite often moved between the two categories, gaining legitimacy after building a business on pirated works, or being challenged as pirates not for violations of
unauthorized printing but for breaching the rules of propriety that governed publishers and stationers, or as a challenge to claims made within the work in question. Adrian Johns, The Nature of the Book: Print and Knowledge in the Making (Chicago: University of Chicago Press, 1998), 167. To this day, these categories are more intertwined than they seem, and much of the work of debating an issue like copyright is articulating where the line between them should be drawn and why.

17. There are, of course, black market sneakers as well as other materiale goods whose manufacture may resemble piracy. But this has more to do with (1) using cheaper materials to recreate the appearance of the sturdier good, and (2) using the trademark of a respected good so as to lure customers to the knock-off—which is not piracy of the sneaker, but unauthorized use of the trademarked brand, and thus the piracy of intellectual property.


21. This concern developed specifically around the press, which enjoys its own special kind of legal protection: imagine if a corporation were to write a puff piece about a controversial new product, and then could shut down criticism by bringing an infringement suit against anyone who wrote an article about that same subject.

22. See Nimmer, Nimmer on Copyright, 1.10[B].


24. These four factors were drawn primarily from Justice Story’s decision in the Folsom v. Marsh case, where he established three of the four (he did not address the “nature of the copyrighted work”). Folsom v. Marsh, 9 F. Cas. 342 (C.C.D. Mass. 1841). The language changed slightly from Story’s rendering to the suggested legislation to the statute: Patry makes a useful comparison between the different versions in an attempt to show subtle changes in priority and the semantic compromises made to assure different interests. See William Patry, The Fair Use Privilege in Copyright Law, 2nd ed. (Washington, DC. Bureau of National Affairs, 1995).

25. Patry, The Fair Use Privilege in Copyright Law, 364; see also Nimmer, Nimmer on Copyright, 13.05[A].


38. Again, to relate the history of the Internet is beyond the scope of my work; I will only be pointing at a few developments that are implicated in the more theoretical issues I am discussing. For a history of the Internet, see Abbate, *Inventing the Internet*; Edwards, *The Closed World*; Katie Hafner and Matthew Lyon; *Where Wizards Stay Up Late: The Origins of the Internet* (New York: Simon & Schuster, 1996); Howard Rheingold, *The Virtual Community: Homesteading on the Electronic Frontier* (Reading, MA: Addison-Wesley, 1993).


46. Rheingold, *The Virtual Community*, 276.

47. Rheingold, *The Virtual Community*, 57–59.


49. Dyson, “Intellectual Value.”


Schiller argues that the NII and the accompanying “Global Information Infrastructure” (GII) proposed to the world were clearly about extending American global power through control of information. But he also notes that this plan was nearsighted; the policies being proposed hoped to extend the strength of American private interests, but it was precisely private interests that, in the information economy, were overshadowing the power of nations altogether.


56. NII White Paper, 12.


58. Samuelson, “The Copyright Grab.”


60. NII White Paper, 16.


63. For a more journalistic account of the trajectory of online music (i.e., less scholarly but more entertaining), see John Alderman, Sonic Boom: Napster, MP3, and the New Pioneers of Music (Cambridge, MA: Perseus, 2001); Bruce Haring, Beyond the Charts: MP3 and the Digital Music Revolution (Los Angeles: JM Northern Media LLC, 2000).

64. "Codec," short for "compression-decompression," is an algorithm for reducing the amount of data required to transmit a body of data. Data can be digitized in an uncompressed form: in text, each character receives an 8-bit binary code; in images, each pixel is given a hexadecimal color value that is then encoded in binary. For text, this poses no problem in terms of transmission, because text files are not of an unwieldy size. But the encoding of other forms of media, whether images, music, or video, can quickly add up to massive file sizes, which then become arduous to transmit over low-bandwidth Internet connections. A codec will mathematically alter the digital code such that it takes less storage space to encode the same information—or its close approximation. Some codecs are "lossless," meaning the algorithm does not lose any information in the process of compression (for example, "gif" files are compressed by noticing sequences of pixels of the same color; rather than recording them as "blue blue blue blue" they are encoded as "4 blue," which requires less code). But most are "lossy," meaning that some information is discerned in the process. The goal then is to discard enough information to shrink the file without discarding so much that the quality of the file is unduly compromised. The "jpg" image format does this by finding similarities in the image and choosing a single color to encode very similar areas. For music files, it depends on removing sounds that the human ear does not register. Some music formats, like Real Audio, compromise the quality of the sound significantly in order to make very small files: the mp3 format is popular in part because the compression incurs relatively little loss quality; though some audiophiles disagree, mp3 is regularly touted as "near-CD quality."

65. Levels 1 and 2 were related compression standards exclusive to high-end devices.


67. Mann, "The Heavenly Jukebox."


73. "Warez" is a term for illegal copies of software; the "z" was a common designator of hacker activity.

74. The No Electronic Theft Act, or NET Act, was passed in 1997 in an attempt to counter the increasing circulation of unauthorized copies of software circulating online. It closed the loophole in existing copyright law in which there was no commercial gain could not be prosecuted as a criminal offense, only for civil damages. The Act made it possible for noncommercial infringement to be considered a criminal violation by redefining "commercial advantage or private financial gain" to include the exchange of copies without money changing hands. It depends on, and I would argue has helped to legitimize, the argument that a traded copy is a lost sale, an argument that gained a lot of ground during the lawsuits against Napster and other peer-to-peer networks. See Stuart Biegel, Beyond Our Control?: Confronting the Limits of Our Legal System in the Age of Cyberspace (Cambridge, MA: MIT Press, 2001), 141–148.


78. This should not come as a surprise, considering the military/academic origins of the network. While the U.S. military had reasons to want their information and personnel to be distributed, instantly available, and geographically scattered, they clearly did not want just any individual to become an information provider on this network. They needed to retain some sense of authority about who speaks, what they say, and how we know to listen. The global aspirations of the American military make it that much more crucial that information be certified and reliable. In the academic community, a need for reliable information in research and the special importance of reputation similarly demand that information be provided only by certain sources under certain conditions. So, while this distributed network does resemble that system of authority, it does not remove it.

79. As I suggested, it is important to remember that although peer-to-peer applications renovated the architecture of the Internet, their contribution is not "new" in
any dramatic way. One of the first protocols designed for the Internet was FTP, or “file transfer protocol”; it allowed files to be requested and delivered before the emergence of a web interface. This in itself worked within the client-server system of the Internet, many models of distributed communication proliferated under the radar of more mainstream systems: the bootleg trading of concert recordings or amateur pornography, for instance; the publication and distribution of ‘zines; and chain letters and Ponzi schemes that took advantage of the “distributed” nature of the postal service to communicate without a central point of distribution. The Gingrich Republicans became famous for using a network of fax machines to get their daily talking points out to their constituents; they were not the first to use the telephone system and its related technologies to organize publication within or by a community. Describing what he called the “Victorian Internet,” Standage describes a system of pneumatic tubes set up between telegraph offices to ease the bottleneck in busy cities. Tom Standage, The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's On-Line Pioneers (New York: Walker and Company, 1998). To extend the history further, we might argue that all communication followed this model in the days before print and broadcast technologies arrived. News, stories, and songs traveled where bards did, possibly multiplying at the moment of performance or retelling when another chose to take them up and share them again. In fact, the ascension of centralized, authorized, mass-distributed cultural expression is, in relative terms, a very recent phenomenon.

80. Interestingly, peer-to-peer technologies must, in the process, make the further demands on the user’s privacy. The first concern, of course, is that a clever hacker could see and even download everything on your computer, not only your music. This has not proven to be a major problem so far. But participation on a peer-to-peer network requires logging in and urges that you make your designated files as available as others do—your MP3 collection is public, meaning your preferences are visible. Of course some have noted that, even as Napster was being heralded as an emblem of sharing, not everyone was that generous: the Napster application allowed users to prevent people from downloading their files while still being able to download themselves, which some users called “leeching.” But, at least in principle, though many did not use Napster to serve files, it was designed to do so. This concern for the privacy of the users reveals more, in the end, about those concerned than about the application. We generally worry about consumers losing their privacy because consumers do not expect to provide anything. When we remember that peer-to-peer, at least in principle, allows anyone to be a provider of information, this “invasion” of privacy is no more substantial than that of any other distributor—publishers do not have the same privacy concerns, because making themselves publicly available is, by definition, the accepted price of participation in a public system of cultural distribution, which is their goal.


82. They would later extend this argument by claiming a “space-shifting” practice analogous to Sony’s time-shifting—that users who owned music would download it at another location, say at the office, to avoid carrying CDs back and forth.


89. Godwin, "What Every Citizen Should Know about DRM, a.k.a. 'Digital Rights Management.'"

90. An article from the National Cable & Telecommunications Association (NCTA), reprinted in Cable Labs' newsletter, suggests that this term was first coined by the Copy Protection Technical Working Group (CPTWG), a coalition of content and technology corporations brought together to discuss the technical possibilities of copy protection. This is surprising, since the work of this group on DVD protection and, more recently, for digital television, aspires to much more protection than this term suggests. See "The Copy Protection Issue and its Impact on Cable," *SPECS Technology* (June 1998), http://www.cablelabs.com/news/newsletter/SPECS/spectechyne/. See also National Research Council: Committee on Intellectual Property Rights in the Emerging Information Infrastructure, *The Digital Dilemma: Intellectual Property in the Information Age* (Washington, DC: National Academy Press, 2000), 218.


93. Stefik, "Shifting the Possible," 140.


98. Stefik, "Shifting the Possible."


100. Stefik, "Letting Loose the Light," 241.


103. Stefik, "Letting Loose the Light," 120-123.


107. Litman, *Digital Copyright*, 22-34.


110. This market dominance was threatened by a high-profile antitrust suit brought by the U.S. Department of Justice as well as a coalition of state authorities: while the most visible violation was that Microsoft built their Web browser into their operating system, many more of the less public concerns were about the kinds of standards Microsoft built into Windows and how they systematically worked against Microsoft's competitors. Lessig serves as counsel for the case. The district court found against Microsoft and threatened to break up the company, but the appeals court backed away from that ruling, urging gentler measures. In 2001, Microsoft reached an agreement with the DOJ, signing a Consent Decree and offering to donate computers and software to schools in exchange for almost all of the punitive measures being dropped. Lawrence Lessig, "It's Still a Safe World for Microsoft," *New York Times* (November 9, 2001): A27.


3. A useful challenge to this perspective is Adnan Johns's history of print, in which he argues that it is not the fact of print that has consequence for Western culture, but the sociopolitical efforts made during the proliferation of print to make print be what it is now taken to be: reliable, trustworthy, permanent, consistent. These were not truths about print technology, but the result of the efforts of political and economic institutions who together produced the "print culture" surrounding it. Adnan Johns, *The Nature of the Book: Print and Knowledge in the Making* (Chicago: University of Chicago Press, 1998). There is also a useful debate between Johns and Eisenstein that extends this line of inquiry: Elizabeth Eisenstein, "An Unacknowledged Revolution Revisited," *American Historical Review* 107.1 (2002): 87–105; Adnan Johns, "How to Acknowledge a Revolution," *American Historical Review* 107.1 (2002): 106–125; Elizabeth Eisenstein, "Reply," *American Historical Review* 107.1 (2002): 126.


