

Digital Technology and Copyright Law

by
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Abstract

Intellectual Property is an ideology of the late Twentieth Century which reserves property-like rights in information, so that creators may extract its economic value. Current American copyright law draws mainly from this concept; it has been constructed through history by negotiation between various established economic interests. Information Freedom is a competing ideology which has been successful in the software community. It emphasizes the dangers of over-propertization and the benefits of freely accessible resources, especially non-depletable information resources.

Compromise must be reached in a practical (non-ideological) fashion in order to achieve the social goals of: production of creative content (encouraged by fair but not excessive compensation for creators); promotion of scientific, political, technical, artistic, cultural, and economic progress by removing obstacles to accessing content and taking advantage of innovations which change the status quo; protection of creative freedom; and ensuring quality and diversity in the content which is created. Civil disobedience as a means to achieve these goals may be counterproductive if it results in tighter technological restrictions on content availability or stricter legal mechanisms; legal reforms proposed by Lawrence Lessig and Jessica Litman are unlikely to be enacted.

Internet-based technologies have strong potential to increase exposure to diversity, decrease costs, and improve the subjective experience for music consumers. Cheaper film-making equipment may have similar positive effects for motion pictures to a lesser degree. Internet bandwidth and other practical limitations suggest that immediate changes in video distribution and consumption patterns are more likely to be driven by the availability of Digital Video Recorders, or perhaps competing Video On Demand services.

Different economic models which fund content creation may be appropriate for different applications, and may in some cases further social goals better than strong propertization. Alternative models include voluntary contributions (either from creators or consumers); indirect benefit by establishing reputation, selling related services, cross-promotion, or selling advertising; and public funding. The history of telecommunication, including the telegraph, radio, television, and the Internet, provides evidence that important uses for new technology may not be initially obvious, that the maturation of digital information technology and related economic models is just beginning.

Thesis Supervisor: David I. Kaiser, Leo Marx Career Development Assistant Professor of the History and Culture of Science

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It should be obvious that the works of Prof. Lessig and Prof. Jessica Litman have greatly advanced the study of the questions raised by this thesis. I am grateful for their scholarship, insights, and persistence.

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1 Introduction

With all the passion I can summon I tell this Committee that if Copyright is allowed to decay, then this nation will begin the slow undoing of an immense economic asset, which will squander our creative future.... Who will invest the huge amounts of private risk capital in the production of films if this creative property cannot be protected from theft? In such a scenario, the ultimate loser will be the consumer.

— *Jack Valenti, President and CEO, Motion Picture Assoc. of America*¹

Through the passage of the DMCA we have criminalized speech and scientific research about the structure of computer programs as well as other simple acts such as reading of books and other media.... These provisions drop an Iron Curtain on the United States of America.

— *The “Free Speech, Free Sklyarov” petition*²

Arguably, the concerns of people like Mr. Valenti prompted the United States Congress to pass the landmark Digital Millennium Copyright Act (DMCA) of 1998. In opposition to the continuing trend represented by this legislation, over 12,000 people have reportedly signed the Web-based petition which is excerpted above, including a number of notable business and political leaders in the open source software community. They blame what they see as the legal and economic erosion of personal freedoms in this country on the corrupting influence of mega-corporations like the major motion picture studios.

Though the collision of new technology and law is nothing new, the details of this particular debate are unique to this time.³ Both sides have the gravest of concerns regarding the future of intellectual and creative discourse in this country. Should the average citizen be concerned? Will democratic forces successfully buffer the power of corporate hegemonies? Or will profit-seeking entrepreneurs combine new technology and government regulation to all but eliminate long-held values and personal freedoms? Or will everything eventually work out right on its own?

This thesis chronicles several related stories in an attempt to discover how and where societal forces are driving law, business, technology, and culture. In the next two chapters, I will highlight important developments in the politics of copyright and the technology of mass communication over the past one hundred years. Chapters 4 and 5 will present case studies of recent collisions of digital technology and copyright law. Finally, I will leave you with some thoughts about the future of these industries, in light of the theoretical and historical lessons I hope to teach along the way.

Approach

There is always a well-known solution to every human problem — neat, plausible, and wrong.

— *H.L. Mencken*⁴

You may have already noticed that I have started harping on four different themes: government, economics, society, and technology. Law professor and author Lawrence Lessig identifies roughly these as the four “modalities” which regulate individual behavior.^{5,6} To be more precise, Lessig uses the terms “law,” “market,” “norms,” and “architecture.” Smoking is a classic example used to explain this theory.

The first two modalities are easy to grasp — a given person might be dissuaded from smoking by a law or regulation (backed up by the traditional threat of arrest, imprisonment, or fines), or by the cost (backed up by law enforcement) of purchasing cigarettes. A “normative” deterrent would be something like a social stigma against smoking. By “architecture,” Lessig means the unavoidable “facts of life” we must cope with when dealing with any technological or natural artifact or system. For example, it might be prohibitively difficult to force a cigarette vending machine to dispense its wares without inserting the proper coinage. Lessig also uses the word “code” to describe these architectural hindrances, appropriately reminiscent of both legal “codes” and the sort of “codes” that one uses to program a computer.

It is important to realize that while these modalities might theoretically be described as separate entities, in fact they are usually highly interdependent. For example, a law might be passed which raises the cost of cigarettes. The government might provide funding for public service announcements which attempt to convince people that smoking is bad for their health

(altering social norms). A different law might mandate that vending machines be specially constructed to deny service to anyone who cannot produce proof of sufficient age. Of course, the government is not the only first mover in this system. The allure of easy profits may spur the tobacco industry to lobby the government not to regulate the product — just as changing social norms might favor tightening the law. Whatever it might try to do, the government is in some ways constrained by the artificial realities of vending machines, ventilation systems, and building design, as well as the less malleable laws determining the behavior of hot gases.

Applying the lessons of this theory to the general problem of explaining technological change, it should quickly become apparent that all four modalities have roles to play. Even though in a given situation, one or more may turn out to be not terribly important, it is necessary to at least consider each one in turn. In the long run, and in the big picture, all four are always important.⁷

Social systems are complicated creatures, not easily prone to simple dissection. As such, I would warn against constructing the four modalities in a rigid fashion. It might be important in some cases to consider artificial “architecture” separately from natural, or to distinguish between individual psychology and group culture. Military and academic institutions are often appropriately set apart from the general functions of governance and commerce. Orthogonal divisions are also sometimes appropriate, perhaps along historical or theoretical lines.⁸

The lack of clear boundaries here does not render Lessig’s theory useless; indeed, flexibility is of utmost utility when analyzing social systems. The four modalities are useful as a way of reminding ourselves not to leave out anything important, and of highlighting relevant questions: “Will cultural factors assist or impede the adoption of this technology?” “Will industry lobby the government to ban this new technology?” “Will the government chose to regulate this behavior directly, or by manipulating markets or technology?” ...and so on.

Even with a holistic analysis, it is possible to get carried away in aimless conjecture. Social theories about technological development which are properly grounded in fact must align in some way with the actual experiences of real-world people with real-world artifacts and systems. Governments and corporations may *not* be conveniently (or cynically) endowed with arbitrary motivations; they are composed of real persons with very human ambitions. End-users may *not* be assumed to have the same concerns about a given piece of technology as its creators. Real consumers are *not* always motivated by the simplistic desire to maximize personal wealth

and material comfort — even though they would be easier to model mathematically if they were — but by a whole host of quirks of human psychology, including a sense of fairness, sentimental altruism, emotional backlash against betrayal and exploitation, self-righteousness, fear, addiction, fads, carelessness, impulse, curiosity, and boredom.

The overriding goal is to identify the concrete ways in which people, technology, and their structures (e.g. countries, corporations, markets, the Internet) interact, so as to understand how perturbations may affect these systems.

In summary, to understand the relationship between social systems and technological development, one must:

- Be holistic, considering the influence of a wide variety of social (government, economics cultural norms) and non-social (technological and natural realities) phenomena.
- Respect complex interdependencies.
- Be flexible in defining the units of analysis.
- Be grounded, describing theoretical interactions in terms of real-world entities and processes.

I will strive to maintain these principles throughout the remainder of this thesis. The next chapter begins the analysis by defining certain “units of analysis,” namely the identifiable groups who each have a stake in the evolution of digital technology and copyright law.

2 The People, Politics, and Ideology of Copyright

2.1 Who Are the Stakeholders?

Despite the bi-polar appearance of the quotations that opened the first chapter, things “on the ground” do not always divide up quite so neatly. To illustrate, let’s consider the life cycle of a typical piece of music.⁹ A professional CD might be created by a team of songwriters, lyricists, performers, graphic artists, producers, and technicians, all under contract with a major record label. (An amateur one might be recorded at a concert or in a rented or hacked-together studio.) A finished recording can be put up for sale at a retail outlet, where it might be purchased by customers who had previously heard it on a conventional, cable, satellite, or Internet radio station, or blaring from the sound system at a local restaurant.

That tune or the recording itself might find its way into jukebox, karaoke machine, player piano, greeting card, conventional CD player, or CD-ROM reader; either might be featured in a motion picture, play, television show, commercial, arcade game, amateur video, book of sheet music, or a library’s audio collection. Accompanying lyrics might be found in a work of fiction, a news story, or an Internet database. The music might be performed again — either by the original artists or by others — at a concert, a party, a church ceremony, or government function. A given work might be studied in a classroom, criticized in a review, or explained in a documentary. A new generation of artists might be inspired to create new music in a similar style, dance moves to go along with the music, or even new works of art which re-use pieces of the lyrics, melody, or even the original recording itself. Books, plays, motion pictures, and other works of art all, of course, have their own complex life cycles.

Clearly, there are more parties involved here than can be easily split up into creative content “producers” and “consumers.” There are many possible intermediaries between the musical creators and the people who enjoy their work; more importantly, all “producers” are also “consumers” of previous works. It would be nearly impossible to write a book, compose a song, or shoot a film (or at least any worthwhile one) without experiencing many pre-existing works in these and related media. Figure 2.1 dissects the overlapping roles of producers, consumers, and distributors into a more concrete (but not necessarily exhaustive or precise) set of interest groups.

Name and Roles	Description	Strong Examples
Creative Talent <i>Produce, Consume</i>	Performers, artists, and intellectuals who physically and intellectually create and recorded a given work, or give live performances.	Book and web authors, poets, singer–songwriters, choreographers, graphic artists, photographers, sculptors, directors, actors, journalists, students, comedians, lecturers, programmers.
Wholesalers <i>Produce, Consume, Distribute</i>	Organizations engaged in distribution to Exhibitors, Broadcasters, Retailers, Libraries. May enter into exclusive contracts with Creative Talent.	Movie studios, record labels, publishing houses, university presses, software publishers.
Exhibitors <i>Distribute</i>	Organizations or individuals who primarily present others’ work to the public in a particular physical location.	Theaters (both motion picture and live drama), museums, art festivals, library and book store exhibitions.
Broadcasters <i>Distribute</i>	Organizations or individuals who primarily transmit their works to the public, over a large physical area.	Television and radio stations carried by terrestrial broadcast, satellite, cable, or the Internet; public web sites.
Retailers <i>Distribute</i>	Businesses engaged in selling or renting material to the public.	Music, video, book, software, and art stores; online content merchants.
Libraries <i>Distribute</i>	Organizations primarily engaged in lending material to the public or an academic community.	Public and university libraries can have vast catalogs of books, art, music, video, and digital archives.
Exhibiting Consumers <i>Distribute, Consume</i>	Organizations or individuals who use music, pictures, quotations, etc. only to enhance the experience of a larger event or location.	Restaurants, shopping malls, electronics stores, church choirs, party hosts, rally organizers, teachers, and lecturers.
Re–Distributing Consumers <i>Distribute, Consume</i>	Consumers who re–distribute (lend, sell, or give away), re–exhibit, or re–broadcast material to other Consumers.	Individuals who lend or make copies of tapes and books; customers of used book, music, and video stores; people who share files on the Internet.
Individual Consumers <i>Consume</i>	Individuals who buy, rent, borrow, view, listen to, or otherwise access works for their own enjoyment or edification.	Radio listeners, TV viewers, web surfers, retail patrons, concertgoers, museum and library patrons, music enthusiasts, commuters, bookworms, theatergoers, computer users.
Producing Consumers <i>Produce, Consume</i>	Next generation of Creative Talent which creates entirely new content, “samples” existing works, or merely works with similar ideas or genres.	Cover artists, students, journalists; critics, satirists, scientists, Free/Open Source programmers, fans, “found art” artists, general Creative Talent.

Figure 2.1: Direct participants in content industries

Note that I have designated all “producers” as “consumers” as well, reflecting the fact that though originality is certainly required to produce new “content,” no one ever really creates *anything* in an intellectual vacuum. In the United States, “creative talent” may, by contract, transfer all or part of the ownership to another party,¹⁰ and works created by employees are automatically assigned to the employer.¹¹ These two mechanisms are used by Wholesalers (as defined in Figure 2.1) in the music and motion picture industries, respectively, to acquire ownership of sound recordings and movies. For example, my copy of the Dave Matthews Band CD, *Crash*, indicates that the recording is owned by BMG Entertainment. Dipping into my video collection, I see that Paramount Pictures owns the copyright on *Ferris Bueller’s Day Off*. A quick survey of a typical American home A/V collection should quickly reveal that in the vast majority of cases, performers do not actually own the recordings which feature them. This is why I have identified Wholesalers as both producer–consumers and distributors in Figure 2.1.

We would expect self–interested producers, as a class, to seek the greatest monetary compensation for their works that the available markets will bear. On the other hand, some producers might not be motivated by the promise of financial reward; an overlapping group are likely to be concerned about maintaining their creative freedom, regardless of profit potential. There is also the question of allocation of profit between Creative Talent and Wholesalers, which subsequent chapters will address in more detail.

Consumers, Libraries, Exhibitors, and non–profit Broadcasters would logically be concerned not only with the cost of content, but also with its (possibly subjective) quality, freedom to make use of legitimately obtained content without substantial technological or legal hindrances, and the diversity of creative voices. We would expect the remaining (for–profit) distributors to be most interested in keeping profits high. This involves keeping down the prices they pay to Wholesalers, optimizing the product of retail prices and retail volumes, and interesting consumers in the content they have for sale. Complicating the picture further, consumers and other end–users would benefit from lower prices, and Creative Talent might receive greater compensation, if the various intermediaries could be eliminated. These intermediaries do provide useful services, however, including financing, publicity, editorial selection, risk management, inventory storage and delivery, and aggregation. Some innovative technical solution or alternative social arrangements would be needed to replicate these if “disintermediation” is to be feasible.

In addition to the groups identified so far, there are a number of indirect participants in the intellectual content industries. Equipment manufacturers (including the makers of VCRs; DVD players; sound systems; TVs and set-top boxes; PCs, content viewing, editing, and production software; e-books; game consoles; camcorders) have an obvious economic interest in maintaining a high level of consumer demand for their products. They would rather not be constrained by legal requirements that they construct their devices in ways that their customers might dislike. For similar reasons, no company wants to get stuck making devices that only support unpopular storage and transmission formats, so long-term predictability in that regard benefits them, though technological changes can also generate lots of sales volume. Both equipment manufacturers and telecommunications “common carriers” (phone, cable, and satellite companies; and Internet Service Providers, or ISPs) have an interest in avoiding liability for contributory or vicarious copyright infringement (this will be explored in detail in chapter 4).

As you recall from chapter 1 and Lessig’s theory of the modalities of regulation, the power of the state can be used to structure technical, economic, and social systems. Each of the content industry stakeholders identified so far has specific economic and social interests they would like to advance; Lessig’s theory should remind us that copyright law is a vehicle by which they might do so.

2.2 Lobbying and the Law

The stakeholders of section 2.1 lay their competing concerns over costs, ownership, and the general health of the content industries, at the feet of Congress, which must resolve these conflicts in the form of legislation. The character of the resulting law has changed considerably over time. Lessig describes the Copyright Act of 1790 and how differently that law functions from the current statutes:

“The initial act gave authors an exclusive right to publish and vend ‘maps, charts and books.’ It therefore essentially regulated only publishers, of which there were about 130 in 1790. The act did not regulate other kinds of writings, such as music or newspapers; nor did it restrict the use of the writings that it did regulate. That is, one could copy, translate or make a derivative use of these maps, charts and books without the permission of the author. The act therefore gave the author no

real control over the work once published, beyond limitation on competition. The initial term of this protection was relatively short — 14 years — and the vast majority of ‘writings’ were never copyrighted. (Between 1790 and 1799, 13,000 titles were published in America, but only 556 were copyrighted.)”

“Since 1790, a lot has changed. Copyright is no longer restricted to ‘maps, charts and books.’ It reaches anything ‘fixed in a tangible medium of expression.’ It no longer regulates only publishers; it reaches anyone who makes a ‘copy.’ Nor is copyright limited to copying: A derivative use of the original work can also be subject to the original copyright. And finally, no longer is the initial term relatively short — for individuals, the term is the life of the author plus 70 years (for Irving Berlin, 144 years); for a company, the term is 95 years (for Windows 95, until 2090). Copyright has thus morphed from a short, relatively insignificant regulation of publishers, to a restriction that is effectively perpetual, and that regulates everyone with access to a computer or Xerox...machine.”¹²

The changes in between have followed a clear pattern. Law professor and author Jessica Litman has a wonderfully illustrative history of the practicalities and disputes surrounding copyright law in the twentieth century in her book, *Digital Copyright*.¹³ As she points out, at the dawn of that period, most copying technologies used to be considerably more expensive and rarer than they are now. As both Litman and Lessig illustrate, it was businesses, not individual consumers, who then controlled the means of distribution; in these circumstances, copyright law becomes essentially a means to settle disputes and normalize relationships between businesses. Where consumers did have access to technology that permitted “unauthorized” copying or performance, they were generally left to their own devices; strict ownership over these rights was apparently not deemed worthwhile to enact or enforce. So the general public, Litman reports, has not historically been particularly concerned with copyright legislation.

Over time, she continues, technological changes (and concurrent economic changes) begin to disturb the balance of interests which stabilizes the business relationships which have been encoded in the law. The disadvantaged parties then begin to lobby Congress to change the law. Each time this has happened in the twentieth century, as Litman chronicles in detail, Congress has essentially acted as a facilitator for resolving conflicts among the parties, which in addition

to the established business, generally include new types of production companies, artists, and equipment manufacturers. (For example, the new “talking picture” studios, or player piano makers.) Once these companies have negotiated a compromise amongst themselves (often at great length), Congress enacts the result into law, generally with a minimum of fuss. But, as Litman points out, not all of the true stakeholders are necessarily invited to or express interest in participating in these negotiations. In her history, this includes nascent industries which are at the time either too small to be invited, or not politically astute enough to invite themselves — and the individual consumer.

This pattern essentially continued into the late 1990s, culminating in the negotiated compromise that passed Congress in the form of the Digital Millennium Copyright Act in 1998.¹⁴ The DMCA is in part a response of copyright owners to the latest destabilizing technology — the Internet. It bans any technology which can be used to circumvent copy protection systems embedded in hardware or software, but grants certain exceptions for security research, library use, personal privacy, and reverse engineering. This helps protect the established interests of copyright owners and commercial distribution intermediaries against the threat of unlimited numbers of perfect digital copies circulating on the Internet and undermining their businesses. It mandates that all new analog VCRs include a certain kind of copy protection called Macrovision which prevents unauthorized copying, but prohibits owners from using this technology to “lock up” anything but premium television services. Internet Service Providers and search engine maintainers are granted exemption from liability, provided they meet certain conditions and follow certain procedures, all designed to make it easy for private copyright owners to control the illegal use of their content.

Litman argues (convincingly) that in the debate leading up to the passage of the DMCA, the most influential interests were those of large corporations. She lists “the motion picture industry, the music recording industry, the book publishers, and the software publishing industry on behalf of the ‘content owners’ and the online and Internet service provider industry, the telephone companies, the television and radio broadcasters, [and] computer and consumer electronics manufacturers...on behalf of the ‘user interests.’”¹⁵ Litman is cognizant of the fact that all of these groups have interests which do not dovetail with the artists or individual consumers whose “side” they are supposed to share. In any case, my general point is to illustrate how some of the parties from section 2.1 have indeed successfully used the tool of government to favor their own

interests. Later chapters will examine in more detail the merits of these laws, but first, we need to establish a normative framework in which to evaluate them.

2.3 Social Goals and Ideology

“We are at a critical moment in the history of our future because we are now witnessing the defeat of what 2000 years had built — the defeat of the open society, the triumph of the closed society, and the destruction of an intellectual commons. And we are witnessing this defeat at the hands of an enemy who has coopted the rhetoric of our past — the rhetoric of freedom that was organized under this ideal of property.”

— *Lawrence Lessig*¹⁶

The Digital Millennium Copyright Act has become something of a poster child for what is really a larger trend in copyright changes over the past century. To understand the direction the law has been headed, and to understand the later half of the path from 1790 to 1998, I turn once again to Jessica Litman, who argues¹⁷ that the “theory” of copyright law has evolved since 1900 through the following stages:

“Quid Pro Quo” — 1900 onward: “The dominant metaphor for copyright was the notion of a *quid pro quo*. The public granted authors limited exclusive rights (and only if the authors fulfilled a variety of formal conditions) *in return for* the immediate public dissemination of the work and the eventual dedication of the work in its entirety into the public domain.”¹⁸

“The Copyright Bargain” — pre-1976: “Copyright was a bargain between the public and the author, whereby the public *bribed* the author to create new works *in return for* limited commercial control over the new expression the author brought to her works. The public’s payoff was that, beyond the borders of the authors’ defined exclusive rights, it was entitled to enjoy, consume, learn from, and reuse the works.”¹⁹

“Intellectual Property” — post-1976: “Copyright provides an economic incentive for the creation and the distribution of original works of authorship.... Copyright has been transformed into the right of a *property* owner to protect what is rightfully hers. (That allows us to skip right past the question of what it is, exactly, that ought to be rightfully hers.)”²⁰

Especially in the past two decades, the growing influence of copyright owners (mostly, as I have mentioned, corporations) has produced something of a backlash, in the form of a counter-movement. Jon “Hannibal” Stokes, an editor at Ars Technica,²¹ paints a picture of two extreme ideologies²²: proponents of this Intellectual Property theory, “intent on letting the ‘free’ market determine a value for information,” and what I will call the “Information Freedom” camp.

Stokes says that Intellectual Property advocates usually feel “that the anti-IP rhetoric coming from the first camp is merely a rationale for piracy,” while those who hold to the notion of Intellectual Freedom see the other camp as “mindless skills for the corporate machine.” He then stakes out some middle ground, saying:

“Somewhere in between these two extremes lies a large majority who find both extremes attractive for different reasons, but who can’t in good conscience commit to one stance or the other. These people (myself included) on the one hand acknowledge the many benefits that IP law has yielded in the modern economy, but on the other hand worry about the ever-encroaching technological and legal threats to our personal freedoms by large, moneyed corporations wielding bands of lawyers.”²³

There is some notion in American democracy (though it is debatable to what degree it is held and how well it is followed in practice) that the law should not be a product of ideological battles, per se. Instead, it should be architected to best achieve certain democratically determined social goals, which may or may not align with any given school of thought. Merely participating in the struggle between two diametrically opposed positions will not lead us to any acceptable resolution of these problems with any speed or certainty of conclusion.²⁴

Among informed people who thoughtfully consider the competing interests of section 2.1, there should arise general consensus on at least the set of problems to be solved, though there may be less agreement on how to solve them. The general set of social goals includes:

- Production of creative content should be encouraged; hence, content creators should be financially rewarded for their work.
- Compensation of content creators must not be excessive, lest it place an unfair burden on consumers, prevent too many of them from experiencing works of

- value, and devote too many resources toward content industries in comparison to other, unrelated social goals.
- Collection of compensation fees should not excessively impede the creation of new works or advancement of science, technology politics, art, and culture.
 - Creative freedom should be maintained.
 - Quality of work is important.
 - Diversity of creators is important.

We these goals in mind, we can then follow Stokes’ advice to focus on debating which legal, technical, economic, and normative “structures” will — in an empirical sense — best achieve these goals.²⁵ Both the Intellectual Property and Information Freedom paradigms do emphasize certain practical tools for achieving these goals, which are worth examining before moving on.

2.3.1 Creative Content as Intellectual Property

“Rivalrous” goods are those which are depleted by using them, or which only a finite number of people can use at any given time. These include many physical goods, like water, land, and metal tools. Our society has created a system of “property rights” which encourage production and regulate consumption of rivalrous goods. Recalling Lessig’s four modalities of regulation, we notice that property rights are enforced by a framework of laws (stealing will get you thrown in jail), social norms (thievery is not generally socially acceptable) and technology (locks, fences, and alarm systems). In this regime, most decision-making is left up to market forces. Scarce goods are usually allocated to those willing to pay the most money for them, and human attention is usually devoted to the creation and modification of goods that will command high profits on the market.

The concept of Intellectual Property²⁶ simply extends these well-known rules and structures to non-rivalrous, information-based goods. (Digital information is non-rivalrous because an unlimited number of people may enjoy the same resource; the cost of copying is negligible.) Under this system, individual and organization automatically receive the right to exploit the full market potential of goods they *create* (not the necessarily what they *possess*; that rule only

makes sense for physical goods). Unauthorized digital copying is thus “theft”; organized theft is “piracy.” In the words of the Recording Industry Association of America:

“No black flags with skull and crossbones, no cutlasses, cannons, or daggers identify today’s pirates...[they] operate not on the high seas but on the Internet, in illegal CD factories, distribution centers, and on the street. The pirate’s credo is still the same — why pay for it when it’s so easy to steal? The credo is as wrong as it ever was. Stealing is still illegal, unethical, and all too frequent in today’s digital age. That is why RIAA continues to fight music piracy.”²⁷

Likewise, the Motion Picture Association of America issued a press release, quoting its own President and CEO:

“‘Creative property is private property. To take it without permission, without payment to its owners, collides with the core values of this society.’ Valenti wondered aloud why ‘otherwise rational people who would not dream of stealing a videocassette off the shelf of a Blockbuster store are using movies without permission or payment.’”²⁸

Intellectual Property proponents (led by large content-producing corporations) have argued to Congress that new technology is in danger of undermining not only the economic prosperity of content owners, but also consumers. The International Intellectual Property Association represents seven large book, motion picture, music, and software trade associations, including the MPAA. Commenting on a Department of Commerce white paper that led to the passage of the DMCA, it said:

“To the extent that [intellectual property protection is] weakened or undercut, the spectrum of information and entertainment products and services made available over digital networks, and the functionality of the networks themselves to end users, will shrink to the lower end of the value chain, or perhaps disappear altogether.”²⁹

In summary, the central idea of Intellectual Property is just what it sounds like — information should be owned or “propertized” and traded on the free market.

2.3.2 Information Freedom

“[T]he ‘information wants to be free’ camp...advocates the free and communal sharing of information and rejects any notion that products of the intellect can or should be understood, legally or philosophically, as property.”

— *Jon Stokes*³⁰

Lessig’s thesis in *The Future of Ideas*³¹ is that applying the same propertization scheme to non-rivalrous information as we have for rivalrous physical goods is not only inappropriate, but causes serious real-world harm. Because of the strict control this gives owners over the use of their works, he argues, propertization can both hamper access to creative works and stifle technical, business, and cultural innovation. He quotes from *An Evolutionary Theory of Economic Change*, a “classic text” on the subject by Richard Nelson and Sidney Winter:

“[I]nnovation in the economic system — and indeed the creation of any sort of novelty in art, science, or practical life — consists to a substantial extent of a recombination of conceptual and physical materials that were previously in existence. The vast momentum of scientific, technological, and economic progress in the modern world derives largely from the fact that each new achievement is not merely the answer to a particular problem, but also a new item in the vast storehouse of components that are available for use, in ‘new combinations,’ in the solution of other problems in the future.”³²

In addition to maintaining free access to intellectual “construction materials,” Lessig argues that technology must be regulated in such a way as to preserve “freedom of innovation.” People with new ideas should not have to ask permission of the government or information owners before implementing them. The established powers historically squashed such innovations because they were seen as either impractical or a threat to existing revenue streams or power arrangements. Lessig draws a parallel between the way AT&T resisted the introduction of packet switching technology (the basis of the modern Internet, and increasingly, AT&T’s own network) and the way record and movie companies today are resisting new technologies. Like the Internet itself, these new distribution systems threaten to compete with and undermine the profits of established players.

To solve this “innovator’s dilemma” (drawing on Christensen’s case studies of how rational, market-based decision-making can lead to stagnation³³) Lessig advocates replacing government and market-based controls with “norms-based” regulation. Certain resources, he argues, should not be “owned” by any one entity; instead, they should be free for all to use. “Control” and “regulation” seem awkward terms for this regime of non-control, but “freeing” resources does not mean their use will become disorganized. Lessig uses the example of the highway system to illustrate this point. In order to provide for public safety, the government issues licenses, traffic regulations, and rules about hazardous cargoes. But in most cases, anyone is free to use any highway at any time, no matter the social or economic reason one might have for traveling. Approval of the government is not needed for novel business models that make use of the system, or for new technologies that traverse it (provided they meet safety standards). The key point is that the value of the national highway system is greatly enhanced because it is “unowned” and publicly maintained. This sort of purpose-specific permission is needed, however, from copyright owners, in order to make use of their works in certain ways. *The Future of Ideas* highlights several Internet innovations that are inhibited by the current emphasis on ownership in copyright law. These include new distribution methods for music, video, and books, as well as wholly new products, like lyrics databases.

This idea of an unowned “intellectual commons,” which Lessig advocates in both *Ideas* and his previous book, *Code*,³⁴ has already gained some amount of popularity in one area — software. In 1984, Richard Stallman launched the GNU project³⁵, which aimed at producing a Free version of Unix, a computer operating system created by AT&T. Free, that is, in the sense of giving users the freedom to copy and modify it; in Lessig’s terms, making it an “unowned” resource. In his GNU Manifesto³⁶, Stallman invited developers across the world to collaborate on this project, for the benefit of all. Since that time, many Free Software projects, including GNU, have worked together to produce (among many others): Linux (an operating system), Sendmail (an e-mail server), and Apache (a web server), BIND (a DNS server), and Perl (a programming language) — all of which are now in widespread use, and which compete vigorously with their “owned” counterparts.

The general idea of Free software (also called Open Source software³⁷) is that the original author gives blanket permission for others to copy, modify, or use the program. The “source code” — the human-readable version of the program — is also made publicly available to

facilitate modification. Technically, the program is still “owned” by the original creator, but the legal tool of blanket permission is used to give the effect of an “unowned,” common resource. Free software is not always free in a monetary sense, as entrepreneurs are free to sell unaltered or modified copies as they wish, though they must compete with others who may give away the same code for free. This does happen in practice; for example, the Red Hat companies sells its popular Linux distribution on CD. Modem users find this packaging more convenient than the free Internet download which the companies offers; these consumers also get technical support and other services from the company for their money.

One problem that Stallman saw with Free software was that private companies could make proprietary changes which they would choose not to contribute back to the community. They could then claim copyright on these modifications, and would have a monopoly on sales thereof. A split would occur between the users of the Free and of the proprietary versions, the latter of which might be granted no access to the source code, and might be denied permission to modify or copy the software.

“Copylefted” software goes one step further and prohibits modified versions from remaining proprietary. Stallman promoted use of the GNU General Public License³⁸ (GPL) by copyright owners as a way to implement “Copyleft” in a legally enforceable way. For example, the Free Software Foundation holds the copyright on many portions of the Linux operating system (which it prefers to call the GNU/Linux operating system, in recognition of the significant contributions of the GNU Project) and makes this material available under the GPL. If Red Hat or any other distributors of the software attempted to sell or even give away a modified version without releasing the source code as well, the offending party would risk a copyright infringement lawsuit from the Foundation. This is because copyright law gives owners the right to control “derivative” works; the GPL only grants blanket permission for the creation of Free derivative works, not proprietary ones. In practice, a variety of both Copylefted and other Free licenses have become popular.³⁹

When an individual or corporate user makes an improvement to a piece of Free Software to solve a particular problem for their own benefit, they may find it more economical to contribute this improvement back to the community, regardless of their legal obligations. The user will benefit from further improvements made by others based on their contribution, and to the software in general, without having to track the many differences that would otherwise arise

between the internal and mainstream versions of the software. Communal software development eliminates redundant effort and helps manage the always significant burden of construction and debugging by spreading the work around. Even users who do not actively modify the software themselves may find it beneficial to be freed from the long-term reliance on a single vendor for support, repairs, and modification, which proprietary software requires.

The ideology of Information Freedom provides clear legal and economic models that are useful for software. Translating these into sustainable models for other content industries, however, is more difficult. Traditional books, music and films are generally not produced in collaboration with their audiences. Continuing repair and improvement is generally not a concern for these works, primarily because they are creative and expressive in nature, as opposed to software, which is really more like a machine that happens to manipulate information.

If they gain nothing by Freeing their works, why should artists and authors be asked to forfeit the compensation that retaining property exploitation rights would give them (even if most must seek supplementary income to support themselves anywayⁱ)? It may serve the other social goals I mentioned in section 2.1 to force them do so, but the question of how to support and encourage content creators remains.

Many Information Freedom advocates, like Lawrence Lessig⁴⁰, prominent Open Source advocates such as Eric Raymond,⁴¹ author of *The Cathedral and the Bazaar*⁴², and others⁴³ support Information Freedom for practical reasons, and so presumably support applying the philosophy only where it does practical good. (Lessig, in fact, argues for a hybrid owned/unowned system.) On the other hand, Richard Stallman is well known for promoting Free Software for *ethical* reasons⁴⁴ (in addition to compelling practical ones). Still others oppose the Intellectual Property regime because they find it to be an unethical or improper abridgment of the Libertarian ideal of free speech.^{45,46} But even Stallman has expressed hesitation⁴⁷ about applying Copyleft licensing to other media, though he firmly endorses it for scientific journals,⁴⁸ encyclopedias,⁴⁹ and software documentation.⁵⁰

i “There are probably only a few hundred self-employed writers in the US,” says Brian Martin, author of *Information Liberation* (Freedom Press, London, 1998), citing: David Vaver, “Intellectual property today: of myths and paradoxes,” *Canadian Bar Review*, Vol. 69, No. 1, March 1990, pp. 98–128. As it happens, Martin has posted his entire book online; the third chapter, from which the above quotation is taken, is available at <<http://www.uow.edu.au/arts/sts/bmartin/pubs/98il/il03.html>>; accessed 30 Jan. 2002. Martin is a professor at the University of Wollongong, so he need not depend on royalties from book sales to support himself. On the other hand, I am paying MIT for the privilege of bringing you this thesis for free.

Others have no such reservations. The Open Content project at Harvard’s Berkman Center for Internet and Society encourages all content creators to use the [cc] symbol to apply a “counter copyright” to works to donate them to the “copyright commons.”⁵¹ In a similar fashion, Ram Samudrala, in his vision of a “Free Music Philosophy,”⁵² encourages artists to “free” their music by granting blanket permission to copy. A profusion of GPL-like licenses and associated registries have been conceived to promote the idea of giving away content.⁵³

2.4 Myth: The Internet Cannot Be Regulated

“It was not at all clear...how, or even if, corporations could own or manage the airwaves. It seemed that wireless might be the truly democratic, decentralized communication technology people had yearned for, a device each individual would control and use whenever he or she wanted, without tolls, and without operators.”

— *Susan Douglas...on the wireless telegraph in 1899.*⁵⁴

“No one can stop me from paying once, then copying and distributing the content for free. Legal and technical means of preventing me from doing so are doomed from the outset — or they will create a big brother world.”

— *A pseudonymous Technolibertarian*⁵⁵

Some Information Freedom proponents seem to share many things in common, including: being employed in the information technology industry, having the ability to program computers, being an “early adopter” of new technology, subscribing to libertarian ideals,⁵⁶ reading the news site Slashdot,⁵⁷ and of course, supporting Open Source (or Free) software. I would like to give people who fit this loose description a name: the Technolibertarians. This group (partly by definition) is predisposed to certain beliefs which sometimes border on the absurd. In the remainder of this chapter, I would like to focus on one particular idea, which is embodied in these three classically Technolibertarian statements, which James Boyle calls the “Internet Trinity”:⁵⁸

“The Net interprets censorship as damage and routes around it.”⁵⁹

“[I]n Cyberspace, the First Amendment is a local ordinance.”⁶⁰

“Information Wants to be Free.”⁶¹

All three, when understood in context, relate to a single underlying theme: the internet is difficult or impossible for real-world governments to control. It cannot be censored, it cannot be localized, and it cannot be stopped. For the purposes of this thesis, it is the idea that no matter what the technical barrier to sharing copyrighted material, there is always an easy way around it. I’m exaggerating only a little — many Technolibertarians seem to think that the sheer technical and economic advantages the Internet offers over older systems will inevitably undermine nearly any restriction that any particular government (or business) wishes to place on it. In fact, though, traditional nation-states and corporations will continue to have quite significant influence on the nature and use of the Internet for a long time to come, just as they have come to dominate the use of radio technology.

It is tempting to think, given how private, anonymous, and divorced from normal, worldly affairs the Internet can seem to be, that it is its own universe, that “cyberspace” is a place apart from “meatspace.”⁶² But it is not. When we are “in cyberspace,” we are also sitting at a computer somewhere in the “real world,” and we are still subject to its laws, just as much as if we were doing anything else. We may sometimes forget that the signals we send over the Internet propagate over real-world wires and through real-world computers maintained by real-world individuals and organizations, all of which are also subject to government intervention. The Internet is no more of a libertarian panacea in this century than wireless telegraph technology was in the last.⁶³

In the United States, government regulates many private behaviors in which one person harms or potentially harms another. These include, for example, personal injury, theft, kidnapping, extortion, threats, fraud, trespass, invasion of privacy, construction of buildings, private contracts, maintenance of property, and possession and use of weapons and other dangerous objects. It regulates an even wider variety of behaviors that take place in the public sphere, including public commerce, public speech (e.g. in newspapers, libel, fraud, and copyright violations; in radio, these and also unlicensed transmitters), and personal movement and locomotion.

Using its powers of investigation, arrest, and punishment, the government has the ability to physically prevent, indirectly deter, and bodily interrupt behaviors which it deems harmful. This sort of regulation is more or less successful depending on how easily the harmful behavior is detected, including whether or not it occurs in public. It is also dependent on democratically imposed limitations on government — for instance, the Commonwealth of Massachusetts is partially hindered in its goal of completely preventing domestic violence by its Constitutional inability to monitor the interiors of all private residences, and the need for trials, limited punishments, and other measures of due process. Lawrence Lessig would interject at this point that governments also have the power to influence social norms, change economic circumstances, and regulate (or physically alter) technological artifacts. These things, in turn, also regulate behavior.

For activities that take place in the public sphere, a government can most effectively exercise its powers of investigation, arrest, and punishment if these conditions are met:

- Laws exist to regulate the behavior
- Enforcement agencies have the appropriate expertise
- Enforcement agencies have sufficient financial and personnel resources
- The responsible party can be tracked down
- The responsible party is in an accessible jurisdiction

If we accept that the government is able to successfully in reducing speeding, illegal parking, the wearing of seatbelts, smoking, and drug dealing (whether or not those efforts are *completely* successful and whether or not we think they are prudent), then at the present time, it is difficult to claim that success in regulating public behavior online is any more difficult. In fact, it may be easier to do so.

Why is this? Virtually all of the transactions offered today in the “electronic marketplace” of the Internet, including public sharing of copyrighted material, are quite easily and legally detected, even by the average technically astute private citizen. Internet Protocol addresses can be traced back to the responsible parties with the cooperation of the Internet Service Provider, which may be compelled with a search warrant. Most Internet users live either within the United States itself, or in other cooperative jurisdictions that also recognize copyright infringement as a

crime. As we shall see in chapters 4 and 5, certain private entities — especially signal carriers and copyright owners — find it in their power and self-interest to engage in their own brands of copyright enforcement.

To be fair, there are a number of ways in which new technology, if properly applied, could frustrate regulatory efforts, including, for example, strong anonymity and offshore data servers.⁶⁴ Traders of copyrighted goods may also avoid detection by making their transactions private and covert, though this will likely significantly reduce the impact on legitimate markets, and also reduce the amount of unauthorized materials that are available. Governments can take further steps to increase the costs of violating the law, and to reduce the benefits. To thwart parties that avoid domestic regulation by flocking overseas, the government may, for instance, freeze domestic assets, or instruct telecommunications providers to block access to offending foreign sites. One examples of successful Internet-related international enforcement of copyright, discussed in chapter 5, is the successful shutdown of the Canadian iCraveTV, by U.S. movie studios. A recent Washington Post article highlights a number of other examples, including regulation of online gambling, Nazi memorabilia, and broadcasts of the Olympics.⁶⁵

A compelling question to ask at this point, is who will win — or at least dominate — this “arms race” between hackers and governments? This prompts other questions which focus on economic, social, and legal interactions and changes. How much effort will people go through in order to circumvent copyright laws? Is it socially acceptable to do so? What if changes in the industry produce what is perceived to be a reasonably priced, legal alternative? How much technical copy protection will be necessary, balancing the costs thereof and industry goals? What laws go further than citizens are willing to accept? Will it be more politically expedient to direct more public money into digital law enforcement, to insist the problem is being dealt with by existing laws and public and private agencies, or to actually go back and change the law to be more permissive? In chapter 6, I will try answer questions like these in more detail, as well as to address the question of what legal, economic, technical, and normative “structures” exist to help achieve the overriding social goals I identified in section 2.3. The intervening chapters will provide the empirical detail necessary to support my conclusions, beginning with the history of telecommunications, and then continuing with the contemporary music and motion picture entertainment industries.

3 Lessons of History — Mass Telecommunications

3.1 Theory

Thomas Jefferson once remarked: “He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me....Inventions then cannot, in nature, be a subject of property.”⁶⁶ The Technolibertarians of chapter 2 have co-opted both Jefferson and his fire analogy⁶⁷ as allies. They (and other Information Freedom advocates) argue that the new possibilities of the *new* and *different* digital medium should not be wasted⁶⁸ by the carrying forward of old rules and homage paid to old interests.⁶⁹ This is exactly what they accuse the large corporate interests in the content industries — music, movies, print, and computer software and games — of doing. They are “manufacturing scarcity”⁷⁰ by using legal and technical tools to restrict the unauthorized access to and copying of information, in a way that preserves the “offline” status quo.

In the context of history, this is not very surprising. There have been countless economic and technological innovations that have been resisted by incumbent interests because they threatened to disrupt existing business. For example, AT&T strongly resisted the introduction of packet-switching (Internet-like) technology in the 1960s, which it believed would threaten its telephone monopoly.⁷¹ Likewise, Litman’s legal history (section 2.2) shows powerful business interests using their influence in the American legislative process to favor themselves over upstart industries. “Progress” in content industries, when it happens, is usually a struggle. But entrenched business interests are not the only source of “friction” preventing change from being nearly instantaneous. Rendering a given technology acceptable to consumers, finding an economic niche in which to market it, and culturally integrating it into the fabric of daily life, inescapably *takes time*. To summarize and expand on these notions, the next section will use the history of telecommunications technology to provide evidence of the following pattern:

- When a telecommunications technology is first introduced, the new medium is at first envisioned as an extension of old, familiar media.

- Integration of *revolutionary* technology into most people’s daily lives takes *decades*. New technology needs adjustment — it needs *evolutionary* change — before it is convenient and cost effective enough to succeed on the market, if it ever does. This evolution requires economic experimentation and cultural adaptation, and may be delayed by any number of “external” factors.⁷²
- In the long term, the dominant or otherwise most significant uses of a new telecommunication technology may be quite different from both original expectations for that medium and from the ways in which existing technologies are used.
- New uses which threaten existing economic and power structures are resisted by incumbents.

3.2 Historical Evidence

The third point is borne out by the history of the first electrical telecommunications technology. The first electric telegraph was put into service in 1838; the primary application of the new technology was sending person-to-person messages, like postal mail. Over time, newspapers began to use the “wires” in a new way — delivering information in real time to central offices from the field, and from there directly to certain customers. The Associated Press, formed in 1848, was the first “telegraphic press association.”⁷³

The development of radio prompted even more radical innovation. Guglielmo Marconi was successfully demonstrating wireless telegraph functionality to European militaries by 1898;⁷⁴ a brief investment “bubble” arose in America financial markets in 1901,⁷⁵ reminiscent of the “dot com” Internet boom of 2000. By 1907 demonstrations of wireless audio (speech and music, as opposed to dots and dashes) were attracting significant business interest, though commercial expectations and development focused on point-to-point communication (like the telegraph and the later telephone) rather than broadcast, until as late as 1920.⁷⁶ The success of the most direct application, the wireless phone, however, had to wait for 1980s-era technology before wireless phones could be made small and cheap enough for the mass market.

Things began to change in the early 1920s, by which time the introduction of vacuum-tube equipment had made broad-area transmissions more practical, the wholesale government seizure

of the radio spectrum necessitated by World War I had ended, and amateur radio operators had begun to popularize the medium, which more and more contained voices and music rather than Morse Code. Early radio “broadcasts,” meant for what small general audience there was at the time, were supported by radio manufacturers, in order to boost equipment sales, but this business model did not survive long. In 1922, AT&T started broadcasting advertisements for the first time on its flagship station, WEAJ.⁷⁷ It called the service “toll broadcasting” or “radio telephony.” The broadcast studio was like a telephone booth; interested parties would pay for the privilege of delivering a message to whoever was listening at the other end. After a few months, it realized that in order to make the endeavor economically feasible, it would actually have to provide programming between the commercial announcements.⁷⁸ The process of refinement and adoption went slowly; it would take until 1934 for commercial radio to reach even half of American households.⁷⁹

Meanwhile, early “mechanical scanning disc” televisions had made their very limited debut in England in 1928.⁸⁰ Commercial broadcasts suitable for modern black-and-white electron-gun sets began in the U.S. in 1939.⁸¹ At first, high equipment cost resulted in slow sales; then, production was interrupted by the United States’ entry into World War II. The cost of a typical TV set fell from (in today’s dollars) about \$4,500 in 1940 to just over \$1,000 in 1948, when market penetration reached about 10%. As prices continued to drop, the adoption rate increased; 50% of American homes were receiving television programs by 1953.⁸² Color TV made its sputtering start in the consumer market starting in the mid 50s.⁸³

While broadcast television is obviously quite different from radio in its capabilities and personal impact, it did not really necessitate innovation in the business models supporting set manufacture, content creation, and delivery. Like most radio of the era, television was generally supported by advertising; the dominant players were a small number of networks (NBC, CBS, and ABC) which provided general-interest national feeds to local stations.⁸⁴ Cable and satellite TV, on the other hand, enable both subscription-based business models and a much wider variety of niche programming and niche formats (all-news, all-movie, all-weather, all-cartoon, all-kid, all-comedy, all-history, all-game-show, and so on). These technologies were not available, however, until the 1960s, and their adoption has been even slower. Even in 1996, cable television had achieved only 65% penetration in the American market.⁸⁵

3.3 Expectations for Digital Technology

What does this pattern of change predict about new digital technologies and copyright law? Taking the points of the theory one by one, first, we should expect initial offerings and terminology to resemble older media. Examples we can find online today include digital “newspapers,” Internet “radio stations,” electronic “mail,” e-“books,” and even e-“commerce” in electronic “stores.” While some of these technologies — e-mail, for instance — have become quite popular, others, like Internet telephony (“voice over IP”) and e-books, have not. I have not done enough research to know which properties these services must have before consumers will prefer them, and what business models are likely to be successful in this realm. But these are interesting questions, which the market will answer more fully in time.

This is also evidence in support of the second point, namely, that most people will not use a new communications medium right away, often because evolutionary (rather than revolutionary) changes to the technology are needed to facilitate adoption. These developments still take a good deal of time. Despite the tremendous speedups over the past century in the mundane tasks of transmitting information, and to a lesser degree, finding and presenting it,⁸⁶ other tasks — manipulating information, achieving understanding, and cooking up new ideas — still take as long as they ever did. There has been no fundamental innovation that accelerates economic experiments, in which new products and services are researched, prototyped, refined, mass marketed, and finally replaced or withdrawn, and in which new business models are tested, improved, succeed, and fail.

A brief tour through more recent history with the canonical Hobbes Internet Timeline⁸⁷ reveals that this newest telecommunications technology also fits the pattern of relatively slow social integration. The seemingly explosive emergence of e-mail and the World Wide Web in the past few years is really the culmination of decades of R&D and behind-the-scenes technical, economic, and social developments. The two underlying technologies of the web are hypertext, the interlinking of documents in the way that modern web pages are connected, and computer networking. The first public demonstration of a working hypertext system was in 1968 by Douglas Englebart,⁸⁸ basic Internet-like packet-switching technology was demonstrated in 1969 by connecting four computers together to form the primitive ARPANet. Inter-computer e-mail, including the modern “@” symbol, was running on the network by 1972. Popular adoption of

these technologies, however, required that computers be affordable to the general public. When this happened in the 1980s, the decentralized, interconnected, and privately owned Internet we have today did not immediately take shape. Instead, among those that used their computers for networking, stand-alone dialup systems became popular, like public Bulletin Board Services (BBSes) and commercial services like AOL, CompuServe, and Prodigy. The communications protocols (TCP/IP) that define the modern Internet were introduced on January 1, 1983, and in 1986 a small boom of connectivity began in American academia. The public had to wait another half-decade before commercial Internet Service Providers (ISPs) became available in 1990; restrictions on commercial activity on the network were not lifted until 1991.

Though file sharing over the network had long been possible via FTP (the File Transmission Protocol), in 1991 the introduction of modern Web protocols (HTTP, the HyperText Transmission Protocol, and HTML, the HyperText Markup Language, in which Web pages are written) improved on this process of retrieving related documents, even if they were in vastly different locations. In 1994, mainstream governmental institutions started serving up information over the nascent Web.⁸⁹ Even so, it was not until the later half of the second decade of modern Internet operation that widespread adoption of Web technology really took place. In 1995, only 5% of the American public and 10% of those with computers had Internet access in their homes, much less a Web browser.⁹⁰ By 2001, at least 53% of the population had home access, and 87% of homes with personal computers were Internet-enabled.⁹¹ Of those without access, the most important reasons for not connecting were reported in 2000 as lack of interest and cost.⁹²

On the third point, we would expect novel uses and business models to appear some time after the technology is first adopted. In the 1960s, computer use was the exclusive domain of large corporations, the government, and academic institutions; the original ARPANet was thus conceived to facilitate resource and information sharing among institutions.⁹³ Evolutionary developments in the computer industry made the Internet available as an information publishing and retrieval tool for the public at large, not just institutional users. E-mail has also become more than simply an electronic version of postal mail. Today, mailing lists and interactive Web sites, (and “newsgroups,” which use different underlying protocols) are used, for example, to coordinate collaborative projects, like open source software development⁹⁴ or academic research,⁹⁵ and to support affinity groups for a whole variety of purposes (political, entertainment, personal support, etc.) both locally and globally.⁹⁶ (Though from personal experience, I would

estimate that most people still use e-mail as a faster way of moving traditional individual and business correspondence.)

Instant messaging (IM), which about half of online consumers use⁹⁷ is another novel use of the network; it is qualitatively different from both the telegraph and telephone. Exchanging telegrams is like conventional postal correspondence, but instant messaging is more like a conversation, since the reply is usually short and immediate. IM systems also enable a person to engage in multiple conversations at once, including group chat. Far beyond the traditional private “conference call,” one finds online thousands of public forums and discussion areas.

The economics of Internet data transportation are not terribly novel; customers have become acclimated to flat rate and per-use subscription fees by the traditional telephone system. Retail commerce is also reincarnated in the digital realm in a familiar fashion. Businesses set up web pages to attract customers and generate orders, as if they were store fronts or mail-order catalogs. But the traditional models for financing commercial broadcasting and publishing operations — advertising and pay-for-access — have not done so well in “cyberspace.” The sheer diversity of sites on the Web tends to spread audience attention more thinly than conventional media, which decreases the amount of revenue available from selling ads. Pay-for-access can be problematic given the danger that customers will make perfect digital copies of their purchases for everyone else on the net. Both of these models also depend on customers adopting new technology (which we have seen takes time and also depends on technical and economic technique) and do not align with the initial non-commercial, everything-free culture which the nascent Internet inspired, and to some degree still fosters.

The fourth and final point in the theory predicts that existing business interests should try to resist changes which threaten their established profit-generating mechanisms. With the Digital Millennium Copyright Act and other recent law changes, the content industries have obtained strong legal ammunition in an attempt to save the pay-for-access model. Traditional broadcasters are currently engaged in several battle to defend their ability to control the rebroadcast of their signals, and to extend their broadcasts into cyberspace on advantageous terms.⁹⁸

The projection of traditional legal and economic regimes into the digital realm is exactly what the Technolibertarians are decrying with the accusation of “manufacturing scarcity.” They

find particularly objectionable the carrying forward, expansion, and digital perfection of pay-for-access model. The Internet is a valuable tool because it “frictionlessly” distributes information, facilitating easy access and cross-fertilization. Denying access in the absence of payment makes experimentation with or implementation of many alternative models — both of economic support and of information flow and structure — more difficult, and in some sense, “turns off” functionality that might otherwise be very important. Search engines cannot cheaply index pay-per-view content. Copy-protected music might not be playable on a portable MP3 player if it was originally downloaded on a desktop computer. Obstruction of free access to content diminishes the potential for future intellectual and cultural innovation and expression; entrenched economic interests and laws engineered to protect them stifle economic innovation.

In any case, the pattern of history suggests that we are just *beginning* the process of developing business models which can sustain content delivery in new digital media, and of discovering novel uses for these technologies. The next chapter will examine in detail recent legal, technological, economic, and cultural developments in the music entertainment industry. It is a story of many struggles: old business interests vs. new, Technolibertarians vs. the law, and Intellectual Property vs. Information Freedom.

4 Case Study — Napster and Digital Music Distribution

4.1 U.S. Copyright Law as It Applies to Music

Copyright law in the United States is, as Litman mentions,⁹⁹ a morass of overlapping provisions and esoteric exceptions. Before pondering how or if the law might be changed to adapt to and guide further technological and social changes, it would be useful to have some understanding of the intricate economic practices and compromises currently encoded in law. This chapter briefly (to the degree possible with such a complex subject) summarizes these arrangements, though this account is by no means authoritative or complete. Nor is it good legal advice about what is and is not allowed; rather, it is an illustration of copyright tools in action.

In general outline, Congress has granted “intellectual property” rights (in this case, separate rights for an underlying musical composition versus a recording of people singing and playing that music) which allow the copyright owner to authorize (often in return for financial compensation) many forms of copying, use in subsequent works, public performances, and transmissions. Different rules apply to analog versus digital recordings, and transmission rights are a morass unto themselves. There are also a number of cross-cutting general exceptions to these property rights, the most important of which is called “fair use.”

4.1.1 Fair Use and Blanket Exemptions

Though it was created in American common law by the courts in 1841,¹⁰⁰ the concept of fair use was codified in statute by the Copyright Act of 1976.¹⁰¹ This is a broad exception which allows consumers to take certain actions without permission of the copyright holder and without paying royalties, even if other statutes make such requirements. This kind of loophole helps protect a limited amount of public access to and use of copyrighted works which would otherwise be closed or too expensive. Congress did not (and probably could not) rigidly define the boundaries of fair use, but instead gave a set of criteria to the courts, by which they are to decide such questions. These are as follows:

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

The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors.¹⁰²

“Purpose and character,” means that for example, use or copying “for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research” would weigh in favor of a ruling *for* fair use. The use or copying of a large amount of material, or for commercial purposes (especially in competition with the copyright holder) are strikes *against* the fair use defense. The “nature” of a work might refer to its genre or the medium in which it was embodied, and to whether or not it was published. The courts have established a number of precedents which provide guidance on how heavily to weight each of the criteria, which I will not describe in detail here.

Some examples of fair use that would otherwise be prohibited by statute include: making use making an extra copy of a CD to keep in the family car, using an excerpt from a song to illustrate a point in an academic paper, or including video of people performing a copyrighted song to document a public event in a newscast. Contrary to popular conception, some non-commercial uses are prohibited, and some commercial uses are allowed. Likewise, not all short or properly attributed excerpts are allowed, especially when used for commercial purposes.¹⁰³ Other narrow but cross-cutting exceptions are also granted by statute, but are not technically a part of the fair use doctrine. These laws allow “public display and performance” in the classroom,¹⁰⁴ creation of a limited number of copies of certain kinds of works for certain purposes by libraries¹⁰⁵ and for the copying of audio books for the disabled, by non-profit organizations.¹⁰⁶

4.1.2 Creating and Publishing Music

After songwriters compose music, if they are interested in receiving royalties for use of their works, they generally register the title with a so-called Performing Rights Organization (PRO), in addition to the Copyright Office, though these are not strictly necessary. In the United States, the music-related PROs are the American Society of Composers, Authors, and Publishers (ASCAP), Broadcast Music, Inc. (BMI), and SESAC, Inc.¹⁰⁷ These organizations are given anti-trust immunity in order that they may license performance rights on behalf of a large number of composers. It would be a logistical nightmare to individually negotiate performance rights with hundreds or thousands of artists as, say, a radio station might need to do. These organizations provide a way to get performance permissions at a standard rate and on standard terms; they also offer “blanket” licenses which cover all their respective member artists, useful for radio stations, dance clubs, and similar users. These organizations process about one-third of the total royalties paid every year to songwriters and publishers.¹⁰⁸

Creating a “derivative work” — using a pre-existing work as the basis for a new creation, whether through modification, excerpting, adaptation into a new medium, or compilation¹⁰⁹ — must always be done by permission of the copyright holder.¹¹⁰ “Borrowing” certain musical or lyrical phrases might be permitted under fair use, especially if minimal and not for commercial purposes. The printing of sheet music for works under copyright must also be done “by permission,” usually arranged by contract. The loan, sale, rental, private display, and public display “directly or by the projection of no more than one image at a time, to viewers present at the place where the copy is located”¹¹¹ of sheet music is permitted without the permission of the copyright holder and the owner of the copy.¹¹²

4.1.3 Performing Musical Works

In order to legally and publicly “perform” a piece of music, permission must be negotiated with the copyright holder directly,¹¹³ through one of the performing rights organizations, or through the Harry Fox Agency.¹¹⁴ HFA is yet another private organization which is in the business of licensing a variety of uses on behalf of a large number of artists.¹¹⁵ A “public performance” is one “at a place open to the public or at any place where a substantial number of persons outside of a normal circle of a family and its social acquaintances is gathered” or which

is accomplished by technological means to “members of the public.”¹¹⁶ Private performances are always allowed without permission.

Special allowances for public performances include include: performance of religious works or performance for religious purposes;¹¹⁷ no-charge and non-profit educational, religious, and charitable performances;¹¹⁸ members-only performance for veterans and certain fraternal organizations, with consideration for costs and purpose of performance,¹¹⁹ and performances in record stores, or on musical instruments being offered for sale.¹²⁰ “Performance” in these special-interest cases does not include transmission to remote locations. There is no conventional performance right in a musical *recording*, so as long as rights for the underlying music have been secured (if needed), it is always legal to play a recording (aloud) without permission.

4.1.4 Making Recordings

The first recording of a musical work must be arranged by permission; this is known as securing “mechanical rights.” (Though this is obviously unnecessary if the recording artist(s) also composed the music.) Subsequent recordings (known in the industry as “covers” if performed by a different artist or group than the original) can be made under a “compulsory” or “statutory” license.¹²¹ This means that the owner of the music and lyrics cannot refuse permission, and the rate is set either by negotiation or at the industry-wide rate determined by interested parties in a government-run copyright arbitration royalty panel, or CARP.¹²² (A common technique, as we will see.)

Technically, the statutory license for the secondary “mechanicals” may be obtained through the Copyright Office up to 30 days after the new recording is made,¹²³ though the author of the underlying work will not receive any royalties unless they are registered with the Office.¹²⁴ However, permission may also be granted directly by the copyright holder or by an agent thereof (with some restrictions on older contracts).¹²⁵ The Harry Fox Agency offers a simpler alternative to the Copyright Office procedure (for composers it represents, which are the vast majority) and as a result handles 80% of such licenses.¹²⁶ License requests for cover recordings at or below the statutory rate¹²⁷ may be processed over the Web.¹²⁸ Notably, for smaller runs (less than 2500 copies), licenses may be obtained in a completely automated fashion, if paying by credit card.

Most music is recorded under contract with a major record company, and this market is remarkably concentrated. The companies of the Recording Industry Association of America account for an estimated 85% of CD sales in the U.S.¹²⁹ While the RIAA membership rolls boast hundreds of “labels” (the company or subsidiary which actually has its name imprinted on the recording)¹³⁰ as members, in fact just five conglomerates dominate ownership of the market — AOL Time Warner, Bertelsmann, EMI, Sony, and Vivendi Universal.¹³¹ As such, the contract terms offered by these companies are to a large degree currently the controlling factor in how recording artists are compensated for use of their works.

Examining a typical American compact disc recording, one will often find two distinct copyright notices. One, denoted by the traditional (C) symbol, is for the underlying musical work — the “sheet music,” if you will. The second is for the recording of that work, and is denoted with a (P), for “phonograph.” Usually both of these copyrights are assigned by contract to the same “label” that publishes the CD (especially if the performing artists also composed the music) which in most cases is a subsidiary of one of the big five media conglomerates. (More on ownership issues later.)

Unlike video tapes, audio recordings may not be rented without permission,¹³² but may be lent (at no cost), sold, performed privately, and shown in public (remember that public “display” means having the tape sit around where people can look at the outside of the physical object, as opposed to “performance” which involves actually playing it) by permission of the owner of the physical copy.¹³³ (The protection that allowed free lending and sale of any copyrighted work is known as the “first sale” doctrine — the copyright owner can only stop the *first* sale; re-sale of a physical copy is always allowed by copyright.) Royalty rates for juke-box operators are set by negotiation or in a government-run copyright arbitration royalty panel.¹³⁴ In the case of recordings of live musical events, the permission of the artists must be obtained before “recording, transmission, sales, rental, or trafficking” in such materials is permitted.¹³⁵

4.1.5 Transmission Rights

The property rights and exceptions surrounding transmission of audio recordings (and the underlying lyrics and musical compositions) are some of the most complex in copyright law. Here we find many fine distinctions which at first glance seem arbitrary, but from Litman¹³⁶ we

know are actually the product of intricate negotiations between parties with strong economic interests in various pieces of the intellectual property pie.

As previously mentioned, the right to “publicly perform” — namely, to play in public, or to broadcast — sound *recordings* is *not* reserved to the copyright holder, though the right to play the the underlying compositions *is*.¹³⁷ This means that only the permission of the composer(s) is required for radio play (or broadcast to a crowded public square, for that matter) and also as mentioned, the Performing Rights Organizations (BMI, ASCAP, SESAC, etc.) exist to facilitate licensing of these activities. Common practice for commercial music radio stations is to simply purchase blanket licenses from the PROs. Broadcast royalty rates for *public* broadcasters are set by negotiation or through government arbitration.¹³⁸

The Digital Performance Right in Sound Recordings Act of 1995 (DPRA)¹³⁹ changed this arrangement for digital transmissions (but not digital copies). This new law (including subsequent amendments) has created a complicated scheme which balances the economic interests of companies in a number of related industries. In this scheme, *ground-based, digital, non-interactive* radio broadcasts licensed by the Federal Communications Commission (FCC) are exempt from recording royalties, but they still must pay royalties to composers.¹⁴⁰ Under certain circumstances, rebroadcasts face some restrictions on the type of transmission and distance from the originating station.¹⁴¹ This preserves the status quo, including the radio industry’s freedom not to pay royalties to recording artists,¹⁴² but disproportionately regulates the fledgling Internet music distribution industry.

Certain remaining classes of digital transmissions are subject to “compulsory” or “statutory” licensing; royalties are paid to copyright owners in both the recording and the underlying musical composition, and are once again set either by negotiation or a government–run arbitration panel.¹⁴³

These transmissions must be *non-interactive*, in that the listener can choose a station, but cannot choose what songs are played. Both pay and free Internet broadcasts qualify, as do digital satellite and cable radio. In some cases, eligibility requirements for statutory licensing require that playlists are not provided in advance, and that a defined number of works from the same albums or artists are not played in a defined period. To the extent that doing so is technically and economically feasible for the broadcaster, it is also required in some cases that copyright, title, and artist information be transmitted to listeners; that the transmission not be easily recorded; and that the user cannot scan a large number of channels to find a particular work (effectively

choosing what songs to hear in an interactive fashion).¹⁴⁴ By law, 50% of the royalties collected for statutory licenses for sound recordings must be distributed to musicians; the other 50% goes to the recording's copyright holder, which might be the artist or his or her recording studio.¹⁴⁵ Music played on *interactive* digital audio services must be licensed from both the music and recording copyright holders. There is no compulsory licensing provision for interactive services, but there are some restrictions on the exclusiveness of distribution agreements.¹⁴⁶

For bands that “cover” previous recordings, the statutory license they may obtain for performance of the underlying musical work also covers all digital transmissions.¹⁴⁷ So, as long as the appropriate royalties are paid, no additional licensing is necessary, and composers cannot refuse permission for online broadcast of any legitimate cover recording.

As if all this weren't complicated enough, for both analog and digital transmissions, there are various exceptions (sometimes involving royalties negotiated through government-run arbitration) which allow organizations entitled to transmit audio recordings to make internal copies for technical reasons.¹⁴⁸ There are also narrow transmission allowances made for retransmission of both types of signal in hotels,¹⁴⁹ food and retail establishments,¹⁵⁰ educational institutions,¹⁵¹ satellite transmission by statutory license,¹⁵² and other relatively neutral circumstances.¹⁵³ To handle collection and distribution of digital audio transmission royalties, the RIAA companies, independent labels, and artist unions formed SoundExchange, a new sort of Performing Rights Organization. It began dispersing payments to artists and record companies in October, 2001.

Because of the relatively burdensome logistical task of monitoring almost every single public musical performance of a copyrighted work, the older PROs use a mixture of census (complete and exact enumeration of works played) and partial sampling (taking a survey of works played a certain percentage of licensed users) techniques to determine how collected royalties should be dispersed to owners.¹⁵⁴ Because it deals exclusively with digital performances, SoundExchange can reasonably request of its licensees a complete listing of all songs played. Considerably less human intervention is required, because software to construct these listings automatically can be installed relatively easily, especially for online media.

4.1.6 Digital Audio Recordings

Like digital transmissions, digital recordings also receive very special treatment. The Audio Home Recording Act of 1992¹⁵⁵ gave consumers the right to make copies of any digital audio recording for non-commercial purposes.¹⁵⁶ This does not include, however, either video recordings with audio,¹⁵⁷ or recordings made by or for general-purpose computers.¹⁵⁸ However, all dedicated digital audio recording devices (which does not include general-purpose computers, professional equipment, and spoken-word devices like answering machines¹⁵⁹) imported to, manufactured in, or distributed in the United States must include the “Serial Copy Management System” or equivalent technology.¹⁶⁰ SCMS allows original recordings to be copied, but prevents the copying of copies. It also encodes all recordings with the globally unique equipment ID number of the source, to make tracing pirated copies easier.¹⁶¹ The system can, with some difficulty, be circumvented,¹⁶² but this is explicitly prohibited by law.¹⁶³

To compensate for lost revenues from this now-legal consumer copying, all manufacturers and importers of non-professional, dedicated digital audio equipment and digital audio recording media must pay wholesale royalties to a central fund. The Librarian of Congress is charged with distributing these revenues to copyright owners of the recording ($\frac{2}{3}$) and the music ($\frac{1}{3}$), with certain percentages reserved for artists themselves (as opposed to the companies they may be under contract with). The details of allocation are based on record sales and airplay.

4.1.7 Implications and Questions

After exploring this tremendously complex legal situation, a good next step is to examine some basic economic realities that the law enables, and others which, in turn, shape it. We can immediately see that this regime quite adequately addresses the practical need I identified in section 2.3 — that artists be compensated for their work. Composers always receive royalties from the publication of recordings, sheet music, and public performance of their works (except for fair use). Sometimes these are paid directly, sometimes a standard license is granted by a Performing Rights Organization or the Harry Fox Agency, and sometimes compensation is made through the digital recording tax fund. Recording artists get royalties from record sales and digital broadcasts, but not analog broadcasts, and from the digital recording tax fund. Consumers are prevented by technological controls from making unlimited digital copies in the case of

digital consumer audio equipment and digital broadcast services. In all other circumstances (namely, the imperfect analog recording process) they face fines and imprisonment if they make copies or otherwise share material in a manner not protected by either the fair use or first sale doctrines.

As Litman claims (see section 2.2), entrenched economic interests have clearly made their mark on copyright law. The big five RIAA companies already profit from their record sales, from digital services, and from conventional radio play when the composer is also the recording artist. The industry is insulated from competition with rental stores (rental is illegal without copyright owner permission), though not from used music stores, which are protected by the “first sale” doctrine. The record companies, by virtue of the new laws, have a competitive advantage in cyberspace over other digital music distributors, and stand to profit even if they cannot leverage that advantage successfully.

The fact that “webcasters” must pay royalties on both recordings and underlying music benefits conventional radio stations, who only need make payments for the latter. Record labels stand to profit by collecting royalty payments from webcasters, even if they do not enter the online market themselves. Internet radio, if using statutory licensing, is also subject to playlist restrictions (playing too many pieces from the same artist or album in a certain period of time) which conventional radio is not. Interactive digital delivery services (including those that allow permanent copies to be kept) are at an even bigger disadvantage, since they must have permission from and negotiate for payment of royalties to both music and recording copyright owners in advance.

On the other hand, the unique licensing requirements of “bitcasting” (especially the need to negotiate for royalties with the major labels) have also made it more expensive for radio stations to simulcast on the Internet. Hundreds of commercial stations have simply stopped bitcasting their signals, or have been forced to apply technical solutions to remove advertisements. (A dispute over whether additional payments were necessary for advertising performances was settled in the favor of the artists.)¹⁶⁴ Many low-budget college radio stations will also be unable to afford to simulcast online because of the need to pay recording royalties.¹⁶⁵

A frequent criticism of the current system of music distribution is that it favors a small number of artists hand-picked by a small number of (corporate) industry participants. Indeed, the ASCAP “sampling” procedure and royalty distribution scheme is clearly biased in favor of more

popular artists.¹⁶⁶ Moreover, the main vehicle by which consumers discover new music is currently commercial broadcast radio.¹⁶⁷ Especially with the demise of many non-aggregation provisions with the Telecommunications Deregulation Act of 1996, ownership of the broadcasting industry has fallen into a small number of corporate hands.¹⁶⁸ It has also been discovered (not surprisingly) that the more a given song is played on the radio, the more copies are bought from record stores.¹⁶⁹ Perhaps because the major record companies also have significant indirect influence over what songs get played,¹⁷⁰ a relatively small number of songs remain in general circulation at any one time, and some consumers complain about overplayed songs being “worn out.”¹⁷¹

Even though consumers are more likely to buy music they have heard on the radio, personal taste also plays a large role.¹⁷² Clearly, some consumers would be better off if they were able to choose from a wider variety of broadcast channels — they should, on average, be able to pick something more attuned with their personal preferences, rather than something that represents the “lowest common denominator” in the small number of genres served by their local radio stations. New technologies — especially services which are able to collect some information from the individual user — should also offer more sophisticated ways to discover interesting music than simply picking a channel from a short, pre-defined list.

Without examining the actual goings-on in the marketplace in more detail, it is difficult to say whether or not the current legal regime will enable such changes to take place, if they are indeed better for consumers. There is also the question of how effective copyright laws actually are in discouraging illicit copying, and whether or not overriding social goals (see section 2.3) are met in practice. The next section looks at recent developments in the digital music industry (underground and otherwise) with these questions in mind.

4.2 The MP3 Revolution

4.2.1 Early MP3 Technology and File Sharing

Compact discs store music in a digital format that is easy for personal computers equipped with CD drives to access and store. However, this raw data takes up an inconveniently large amount of space, over 10 megabytes (MB) per minute.¹⁷³ MPEG-1 layer 3, commonly known as

MP3, is a patented¹⁷⁴ audio data compression format which reduces these storage requirements by a factor of 10 with almost negligible loss in quality. A typical popular music track can thus be stored in about 3–5 MB. Files of this size can be downloaded in about 7 to 12 minutes by 56kbps modems (now common) or in less than a minute by faster but less prevalent “broadband” devices.

A confluence of technologies — digital compact disc recordings, personal computers, CD drives, hard drives capable of affordably storing hundreds or thousands of megabytes of data, relatively fast Internet connections, file transfer protocols, search engines, and the MP3 compression algorithm — enabled a new phenomenon. Technically astute Internet users would copy, or “rip” songs from CDs, compress or “encode” them in the MP3 format, and then (illegally, as detailed in section 4.1) make them publicly available on the Internet. Typically, however, the means of finding and accessing these files would be either time consuming, require some amount of technical sophistication, or both.

For instance, it was common practice among “early adopters” of MP3 technology to post files on an FTP or Web server. Dedicated search engines provided an indexing function for this diaspora, but many servers would be offline, overloaded, or require the user to upload files before downloading (a sort of quid pro quo), and this could make the search process quite tedious. Moreover, using FTP in this manner requires slightly more technical sophistication than most members of the general public possess, as did using Internet Relay Chat, a sort of instant messaging protocol which has a facility for transferring files directly from user to user, called Direct Client Copy. To make the process fit for popular consumption, an easier way to find and download MP3s was needed. This is exactly what Napster provided.

4.2.2 The Napster Explosion

In its first incarnation, Napster¹⁷⁵ was a “client” program that users would download to their personal computers. It would connect to a set of central servers which functioned as a search engine for the entire system. Users would then type in the name of the artist or song they wanted to find, and then click through a list of copies they could download. Only files which were currently available at the time of the search were listed, greatly simplifying the selection process. The actual music files were not stored on the central servers, but rather on the personal

computers of other users. The Napster client itself allowed those users to share their existing MP3 collections, and handled the details of the file transfer, which proceeded directly from one user's computer to another, or in a "peer to peer" fashion. Only one person needed to "rip" a song off of a CD in the first place; after that, copies could circulate in the Napster community indefinitely, as long as at least one person was sharing a copy. Aside from the one-time MP3 encoding process, there was no loss of quality, because of the digital nature of the storage and transmission medium.

Napster became a popular success at an astounding rate. In just 15 months, the number of Napster users online at any one given time spiked from less than 100 in June 1999¹⁷⁶ to an average of 640,000 in September 2000.¹⁷⁷ By December 2000, as many as 1.3 million people were using the service at any one time, and there were more than 50 million registered users.¹⁷⁸ This incredible trend resulted in a user base that rivaled the market share of America Online, the world's largest Internet Service Provider.¹⁷⁹

This speedy growth seems to contradict the theory that large-scale adoption of new technology takes decades. But consider that Napster was really just the last piece in a puzzle which took decades to assemble and perfect. (And, of course, it was neither profitable nor legal.) I have already discussed the slow popular adoption of Internet technology in general (see section 3.3), which itself was predicated on the creation and widespread adoption of cheap, reasonably powerful personal computers, but now consider the history of digital music storage and sharing technology.

CDs were first prototyped in the late 1970s and offered for sale the public in the early 1980s. CD-ROM drives were introduced in 1985, making it possible for people to listen to CDs using their PCs instead of a traditional stereo. By 1990, American household market penetration of the compact disc was only 28%.¹⁸⁰ This is relatively leisurely, considering that CDs are really nothing more radical than an improvement on cassette tapes and LPs. Despite the format's improved quality, durability, and new "random access" features, it took time for people to invest in the new equipment necessary to play the discs, even after it was wholeheartedly adopted by music retailers.

On the transmission side of things, music has been shared over computer networks since the days of pre-Internet services in the 1980s.¹⁸¹ The limits of storage, processor speed, and bandwidth, however, meant that it was in the form of what is essentially electronic sheet music.

Early PCs could only play back a few synthesized notes at a time, and display the lyrics and some simple graphics. As the years passed, computers gained the capability to play recordings, but practical sharing of high-fidelity music over the network was still impractical without higher bandwidths and a good compression format. MP3 technology was actually developed and patented in the late 1980s,¹⁸² but the first efficient playback software was not developed until 1997, by a student at the University of Zagreb in 1997.¹⁸³ This was the leading edge of the World Wide Web explosion.¹⁸⁴ Two years later, and at least a decade and a half after the first music sharing networks, Napster began its spectacular rise to fame.

Napster was thus the final refinement of a procedure which had been technically possible, if inconvenient or expensive, for at least a decade and a half. Once the pieces were finally in place, adoption was unusually rapid — but understandably so. Radios, TVs, PCs, Internet connections, and CD players all cost money. Napster was free; it didn't even require a trip to the store or a phone call to an ISP, just a few clicks of the mouse and a little download time. Napster was most quickly adopted in colleges and universities, where technical and cultural factors aligned to prepare users for rapid uptake. Fast Internet connections and PCs were common, music listening was a common hobby, communities were relatively well-equipped to spread news of this new and easy to use technology, and most were happy to ignore the fact that some seemingly unenforceable law was being violated.

I have previously cautioned (see section 3.3) that the process of adapting the content distribution industry to the Internet is just beginning. Given that Napster failed to compensate musical authors and recording artists for their works, its system seems neither sustainable nor socially desirable. It seemed for a while to mark an unconditional victory against both established interests (the powerful record companies) and proof positive of the unregulability of Internet technology. But the slower-moving legal and economic powers-that-be — enforcing the rules of Intellectual Property — soon presided over the destruction of this first incarnation of Napster.

4.3 The Law Revisited: Digital Music Lawsuits

A slew of record companies, including both RIAA and independent labels, sued Napster for aiding copyright infringement.¹⁸⁵ A class action lawsuit was also filed by songwriters and music

publishers.¹⁸⁶ After an appeal to the federal Ninth Circuit, the lawsuits succeeded in bringing about injunctions¹⁸⁷ that forced Napster to exclude unauthorized copyrighted materials from its service, based on lists provided by content owners. Napster began filtering MP3s based on file names, then licensed technology that would actually examine the acoustic properties of the recording to identify them. The number of files being shared fell through the floor, and users flocked to alternative services.¹⁸⁸ Eventually, the company chose to suspend service completely.¹⁸⁹ Napster mounted a number of arguments in its legal defense, all of which failed.

4.3.1 Fair Use¹⁹⁰

The Napster corporation argued that the primary uses of its service were fair uses, namely, as it claimed: 1.) distribution of songs authorized by the copyright holder, 2.) sampling music before buying, and 3.) downloading music one already owns on CD. The courts found against Napster (or more precisely, its users) on all four fair use criteria (see subsection 4.1.1), for the following reasons:

1. ***Purpose and character, whether use is commercial:*** File sharing adds no new creative value to the works copied; Napster users “profited” from the service by not having to buy CDs.
2. ***Nature:*** Music is a creative medium (as opposed to something factual or political) and thus stronger protection was warranted.
3. ***Amount used:*** Napster facilitated wholesale copying, not limited excerpting.
4. ***Effect on market:*** Based on detailed consideration of competing expert opinions and surveys, the courts concluded that music sharing on Napster caused market harm by decreasing album sales among college students, and by undermining the copyright owners’ ventures into the online music distribution industry.

Of the three uses the Napster corporation claimed were legitimate, only the first — the sharing of works as authorized by the copyright owners, which is legal irrespective of fair use — was approved. With regard to the second use, the court incidentally discovered that other,

licensed web sites that offered pre-purchase music sampling were much more restrictive. Users there were restricted to short clips, could not make permanent copies, and the site owners paid royalties to copyright owners. Napster had no permission to allow sampling, placed no restrictions on its users, and did not pay any royalties. The third use — downloading music one already owns — was termed “space-shifting” by its defenders, and has a more complicated history.

4.3.2. Shifting in Space and Time

In the landmark 1984 Supreme Court case *Sony Corp. v. Universal City Studios et al.*,¹⁹¹ which affirmed the VCR’s status as a legitimate commercial product, the judiciary concluded that “time-shifting” — the personal recording of a television program for later viewing — was a fair use. In 1999, the same appeals court hearing *Napster* made a similar ruling regarding the Rio, a device that stored and played MP3 files, functioning not unlike a portable CD player. In that case, *RIAA v. Diamond Multimedia*,¹⁹² the court ruled that “space-shifting” — making a personal copy on a different device for use in a different location — was also a fair use. Two years later, the *Napster* case resulted in a determination by the Ninth Circuit that offering copies for download the world at large, which is what a Napster user does, is a fundamentally different and unprotected activity. In both cases, the court determined that the systems in question — Diamond’s portable MP3 player, and Napster’s file sharing network — did not meet the definition of “digital audio recording devices” needed for protection under the blanket copying exemption granted by the Audio Home Recording Act¹⁹³ (see subsection 4.1.6).

This raises an important question for Internet users about the practice of downloading songs they already own. One problematic aspect of Napster was that its users were not required to prove that they already owned a legitimate copy of a song before downloading it. What if they had been? In an unrelated lawsuit, another district court had ruled that this still would *not* have been fair use.

The commercial website MP3.com once offered users the ability to access MP3 recordings stored on its central server after demonstrating ownership of an existing copy. Users did this by either buying a CD containing the recording from an online retailer affiliated with the site, or by inserting the CD into their computer and having it “fingerprinted.” Once this process was

complete, the user could listen to the centrally stored recording from anywhere on the Internet. Various record companies sued, and in mid-2000, the courts determined that this was not a fair use.¹⁹⁴ The problem in this case was that MP3.com was essentially undermining the legally constructed competitive advantage the copyright owners would have in the online music market, and it was doing so by making use of their works without permission. The resultant damage to potential economic rewards, the court said, preempts the “space-shifting” defense successfully used in *Diamond*.

4.3.3. Liability as a Service Provider¹⁹⁵

The copyright owners suing Napster had to prove not only that the system’s users were violating the law, but also that its creators were liable for the community’s “direct infringement.” Indirect liability under the theory of “contributory infringement” requires knowledge and material contribution to the direct crime.

In *Sony*, the Supreme Court determined that VCR manufacturers were not liable for contributory infringement because they had no *specific* knowledge of the infringement activities of any of their individual customers. They of course knew that some consumers *might* misuse their product, but they also knew that it was capable of “substantial non-infringing uses.”

The Napster founders, on the other hand, had posted pictures which prominently featured a copy of the program displaying the system’s bounty of illegal downloads. They had clearly witnessed *specific* instances of direct infringement. Moreover, it was technically and legally feasible for them to intervene to stop the activity. It would be unreasonable to expect Sony to send corporate inspectors into people’s homes to apprehend VCRs from owners who made illegal copies, but it was feasible enough for Napster to alter their server software to suppress certain file names, or to terminate repeat offenders. In fact, Napster had expressly reserved the right to do so in its “terms of use” policy, but continually failed to intervene, even after it had been served notice by copyright owners. The company also hoped to profit from the illegal activity by indirect means. Collectively, these facts, the appeals court ruled, made it likely that the plaintiffs would succeed in their case.

The courts did not determine whether Napster would be exempt from indirect infringement liability under special exemptions granted by the DMCA to ISPs, search engines, and other

online service providers meeting certain conditions. Given the history of the case, however, the lower court that would have decided the rest of the case would have been unlikely to rule in its favor on these issues.

4.4 Fallout

These lawsuits were not the end of the Napster company. It managed to settle the class action lawsuit with songwriters, and partner with major and independent record labels as a commercial online provider of their recordings.¹⁹⁶ The new Napster uses a proprietary, secure file format (called “.NAP”) to prevent unauthorized copying and uses (such as playing on portable devices); it also charges for its service. Authorized, unrestricted files in the MP3 format will also be carried.¹⁹⁷ Napster’s affiliation with the music divisions of AOL Time Warner, Bertelsmann, and EMI, and the independent Zomba, is through a partnership called MusicNet, a “platform for digital music subscription services.” Various partners, including Napster, are allowed access to the collective catalog, but set their own pricing policies and create their own user interfaces. RealNetworks, the fifth partner in the venture, is already offering access through its “RealOne” service. This includes streaming (listening without making a permanent copy) and downloadable music, in addition to net-based radio and video offerings from a variety of non-MusicNet partners, including Disney, News Corp., Sony Pictures, and Universal Music.¹⁹⁸ Downloaded RealAudio tracks expire at the end of each month.¹⁹⁹ AOL has launched a test version of *its* music service, which will reportedly allow the customers of the world’s largest ISP to download or stream up to 100 songs each for \$10 per month.²⁰⁰

PressPlay is a joint venture similar to MusicNet which includes the record catalogs of the other two RIAA companies, Universal and Sony, as well as some independent labels. EMI, a MusicNet partner, is also cross-licensing its music to the venture.²⁰¹ It has partnered for distribution with Microsoft (Windows Media is the preferred format, and MSN is a service outlet), Yahoo!, Roxio, and MP3.com. The first three distribution partners have already launched pilot services, and more providers are expected to come online in the future.²⁰² Unlike users of MusicNet-affiliated systems, PressPlay customers are able to burn songs to CD, though this is subject to per-track permission by the owners, and the number is limited by the user’s service plan.²⁰³ Downloaded songs can be accessed only as long as the user has a subscription with the

service; the cost is currently \$10 a month for 300 streamed songs and 30 downloads, or \$25 for 1000 and 100, respectively.²⁰⁴

EMusic.com, owned by Vivendi Universal, has its own service with a small collection of independent-label (though not necessarily obscure) artists, for which it offers unlimited and unrestricted MP3 downloads for monthly flat fee comparable to its competitors. Independent Listen.com offers unlimited streaming for \$8 per month, but no downloads, and an even smaller catalog. Vivendi Universal also now owns MP3.com,²⁰⁵ which currently offers users the opportunity to sample, and in some cases buy (in CD and “streaming CD” form) music from a variety of lesser-known artists.

Webnoize, a Cambridge, Mass. entertainment industry research firm, calls these sites “Digital Music Aggregators.”²⁰⁶ Given the strong restrictions these services currently place on users, their popularity in the long term remains to be determined. Many Technolibertarians²⁰⁷ and others²⁰⁸ still (not surprisingly) prefer the free, unrestricted, and illegal file sharing alternatives to paying for legitimate online music services or to buying conventional CDs at “bloated” prices.²⁰⁹

It is conceivable that the major labels will eventually learn what allowances consumers must be given to justify the cost of the services. They might also cross-license all of their works to each others’ services (as EMI has already done) to mutual benefit, creating something vaguely resembling the ideal of a “celestial jukebox” — an online service that contains every piece of music ever recorded. It remains to be seen to what degree independent artists will continue to be included, and whether or not there will also be independent, innovative sites peddling the world’s cumulative store of music. At least one bill has been introduced in Congress which would require copyright owners to grant similar license terms to all interested online “aggregators,” which would prevent independent vendors from being licensed out of the market.²¹⁰ As of this writing, the bill is still in committee; U.S. Department of Justice²¹¹ and European Union²¹² anti-trust regulators have apparently hesitated over intervening in this nascent market, despite the high concentration of ownership.

Wherever the market goes, it will take some time to settle out; perhaps most keenly aware of this are the large, established interests. Reuters quoted Bob Pittman, AOL Time Warner’s co-chief operating officer, as saying: “MusicNet is not something that’s going to change the business overnight....We are realistic about what it is and what it is not.”²¹³

As far as free, unrestricted, illegal alternatives go, there are still plenty to choose from. One of the most often-mentioned is Gnutella.²¹⁴ Originally conceived by programmers employed by AOL,²¹⁵ this unwanted child was quickly adopted by the open source community. Now, no one community or group of people is in charge of the system, and there are a number of client programs, some developed by for-profit companies, others maintained by volunteers. Unfortunately, the technology was never designed to support a massive flood of Napster refugees, and so currently, a given search will only reach a fraction of the hosts actually on the network.

The most popular²¹⁶ unified system (as of October 2001) was created by a Scandinavian company called Consumer Empowerment.²¹⁷ The underlying file sharing technology, called “FastTrack” is licensed to other development groups, who create the actual end-user applications; the former currently include KaZaA (Netherlands/Australia),²¹⁸ Music City (Tennessee),²¹⁹ and Grokster (West Indies).²²⁰ The international nature of product development has not yet hindered legal action. The International Federation of the Phonographic Industry succeeded in getting a Dutch court to order the shutdown of the KaZaA system²²¹ and a slew of movie studios, record companies are suing Grokster and Music City.²²² It is unclear what level of control these companies have over the software which has already been distributed to millions of users, which they claim forms an autonomous network.²²³ If the technology is or becomes fully independent of its creators, law enforcement agencies will have to shift their focus to individual users who provide large amounts of content.

In the first half of 2001, the RIAA had 8,716 infringing online auctions terminated,²²⁴ and sent an undisclosed number of “DMCA takedown notices” to Internet Service Providers, including colleges and universities.²²⁵ The Motion Picture Association of America recently sent hundreds of similar letters, targeting Gnutella users.²²⁶ The Act grants immunity to ISPs if they promptly remove infringing material which their users have posted.²²⁷ With peer-to-peer systems, this may mean disconnecting users from the network altogether, because the material is not stored on ISP-controlled computers. This is a somewhat drastic measure,²²⁸ some ISPs (including large providers like Verizon and EarthLink) have hesitated or refused to comply. These intermediaries have conflicting motivations — they are understandably reluctant to terminate paying customers, even though nearly all have strict policies prohibiting illegal activities on their networks. On the other hand, since file sharing customers use a

disproportionate amount of bandwidth, they may save on infrastructure costs by selectively terminating infringing users. Perhaps the ultimate test of whether or not commercial ISPs (or even educational institutions, which fill a similar role) will assist in copyright enforcement actions is their resulting liability exposure. Consider the standard articulated in the *Napster* injunction: actual knowledge of specific direct infringement, technical and legal feasibility of intervention, and failure to act. After receiving a “takedown notice,” an ISP with an infringing customer would seem to meet all three criteria if it did not promptly terminate service — if a crime were actually being committed.²²⁹

In section 2.4, I mentioned the enforcement evasion strategy of seeking offshore data havens. In the music realm, the Canadian group FairTunes is attempting to raise funds to run a Napster-like service in the sovereign and copyright-free Principality of Sealand, and incorporating a holding corporation in a third country with an equally lax legal structure.²³⁰ This seems both expensive and prone to failure, given the power copyright-enforcing countries might choose to exercise over mainland Internet Service Providers and other intermediaries. Even if the scheme succeeded, it would merely shift the focus of enforcement from the operators to the system’s domestic users, which is the same problem posed by fully decentralized and autonomous systems (which Napster was not).

I also mentioned in that section that digital technologies can make it significantly easier to detect and intercept individual copyright violators. A company called Ranger Online, for example, is marketing an automated tool for scanning the Internet for infringing works, informing copyright owners, and generating the appropriate legal paperwork.²³¹ A competitor named Copyright Control Services aims to make this process self-sustaining, by offering offenders the opportunity to settle out-of-court for \$3,000–\$5,000, which is presumably considerably more attractive than fighting a losing court battle against a large and well-funded company, and end up paying \$100,000 in statutory damages.²³² It is unclear whether or not content owners would risk the political and economic backlash that widespread application of these techniques might cause, but the potential to exploit them does exist.

If they do proceed, users may choose to limit their exposure to the risk of legal action by sharing files only with trusted friends (or trusted strangers). Another “peer-to-peer” system called Aimster (whose creators are also being sued) has successfully demonstrated this concept. This sort of fragmentation, however, obviously reduces the number of files on the system

available to any given person. (And really, this level of “acquaintance” copying is not much greater than that permitted under the Audio Home Recording Act with dedicated digital audio hardware; see subsection 4.1.6.)

The ultimate solution for users seeking a free and unrestricted service would be a distributed file sharing system that was publicly accessible and provided strong anonymity for both publishers and consumers. These are precisely the design goals of the Freenet Project,²³³ originally conceived by Ian Clarke, a former student at the University of Edinburgh, Scotland. The network is also designed to be resilient to forced closure of many nodes, and to prevent participants from knowing what files are being stored in the local hard drive space that they donate. This gives litigious copyright owners no central organization to sue, and makes it difficult to accuse any given node holder of contributory infringement, since the system works hard to ensure they have no “specific knowledge” of any such activity. If Freenet is implemented correctly, it would also be extremely difficult for law enforcement officers to link illicit files with the people who are uploading or downloading them. In Freenet, even a single request generates a series of new copies throughout the network, potentially crossing through multiple legal jurisdictions.

Freenet was founded on the principle of absolute freedom of speech and with the goal of preventing any and all forms of censorship. Ian Clarke’s philosophy understands enforcement of intellectual property rights as a form of censorship, and declares it utterly incompatible with the concept of free speech.²³⁴ So far, the system has not been widely adopted, most likely because completion of the technical infrastructure is proceeding slowly, and because it currently requires moderate technical expertise to install and use successfully. There are at least two projects (Espra and Snarfzilla) building user-friendly interfaces for the system, both providing electronic means to donate funds directly to artists.²³⁵ Neither has seen much progress in the past few months. Perhaps if consumers are driven from the more popular peer-to-peer systems, or if other, related needs arise, people will have more of a need for strong anonymity in their lives, and more attention will be given to these projects.

The implications of a move to a strongly anonymous system would shift the problem yet again, in one of three ways. One strategy the legal system might use would be to “defang” the system, by making it illegal to run software providing strongly anonymous file sharing capabilities, or without copyright protection safeguards built in. If you think this seems horribly

intrusive and potentially unworkable, you are not alone. A second option would be to accept the system and find a completely different way to finance the music industry; not likely, given the business interests of powerful corporations would be at stake. A more plausible outcome would be for the content producers to “bottle up” new releases more tightly so that they never make it onto the system in the first place. Distributing music in a more secure medium to begin with actually reduces the necessity of cracking down on file sharing in general — at least for new content. The Universal Music Group has already announced plans²³⁶ to incorporate copy protection in all of its future releases.

Enabling copy protection features in the compact disc, a medium which was never designed with such capabilities in mind, is a difficult task. By slightly altering the way in which data is encoded, the present goal is to prevent CD drives connected to PCs from being able to read the discs, while still allowing conventional consumer devices to play them normally. Because of the latter constraint, it is not difficult for the technologically astute to compensate for the encoding changes²³⁷ and continue to “rip” tracks and encode them into MP3 files which can be shared on the Internet. To assuage consumer complaints²³⁸ that this kind of copy protection prevents people from legally playing CDs on their computers, Universal has included software on the discs that allow the protected tracks to be played on Windows-based computers, but not to be copied.²³⁹ This does not, however, address unhappy owners of portable MP3 players and non-Windows-based computers, who cannot use these protected discs in convenient ways which remain perfectly legal.

It would be considerably safer for the industry to publish its music in a truly secure format. DVD-Audio players can play conventional CDs, but their native format is encrypted, making them an obvious candidate. Unfortunately, moving consumers to this new format would require them to invest (once again) in a new playback technology. They will be slow to do so, given their satisfaction with CDs (despite the longer playing time of DVD-Audio discs), the installed base of CD players and availability of discs in that format, and the increased expense of contemporary DVD-Audio players. (And DVD copy protection has its own problems, as chapter 5 will reveal.)

4.5 Artists, Contracts, and Innovative Discovery Technology

The recording companies are joined in their alarm at the proliferation of online file sharing by many musicians.²⁴⁰ These businesses, though, shore up profitability not only by clamping down on piracy, but also by minimizing the compensation they pay to artists and songwriters. As I have previously mentioned (see subsection 4.1.4) the RIAA companies control 85% of the record sales market, and their music dominates broadcast radio, the primary vehicle of promotion. If a band wants to publicize its music to a wide audience, its best option is arguably to sign a contract with a major record label. Unfortunately, due to their market dominance, these companies have considerable leverage in negotiation, and end up reserving for themselves the vast majority of any eventual profits.²⁴¹ Artists, well-known or not, get very little in return for their creative efforts, relatively speaking. The quite famous (and major label–signed) recording artist Courtney Love put it this way:

Since I've basically been giving my music away for free under the old system, I'm not afraid of wireless, MP3 files or any of the other threats to my copyrights. Anything that makes my music more available to more people is great.²⁴²

While Love is trying to extract herself from her recording contracts, the lesser known, but reasonably successful²⁴³ artist Jim Infantino and his band have avoided signing themselves into “indentured servitude” with a major label; Jim has this to say about online distribution:

I am a big supporter of the FREE and UNHINDERED distribution of music on the web. As much as the owner of a club has the right to have a jukebox playing in his establishment we feel that everyone has the right to trade mp3s on the web NON-COMMERCIALY. I hope that some day sites like Napster will pay dues to ASCAP and BMI — so that the songwriter will get the money owed to them for helping these web based companies generate money. But I will be very very clear that I do not feel that under any circumstances are RECORD COMPANIES entitled to money from web-based applications for trading music. They should be thankful that the music is being traded and people are getting interested in a bands back catalog for NO-EXPENSE (unlike the expense of radio promotion)....They have been ripping off the artists who have made them money for 40 years and

now they get upset that they can't make the few extra bucks from the Internet?
Screw that.²⁴⁴

Digital distribution methods are a boon for the vast majority of artists who would never become well-known under the current system, either because they are rejected by the major labels²⁴⁵ or because they are under-promoted. These artists are also under-recognized by the sampling techniques used by Performing Rights Organizations in analog media, especially in genres more popular in media other than radio (see subsection 4.1.7). Love remarks:

How can anyone defend the current system when it fails to deliver music to so many potential fans?...The status quo gives us a boring culture. In a society of over 300 million people, only 30 new artists a year sell a million records.²⁴⁶

The reason radio is such a useful medium for promotion of new or undiscovered music is that it mixes familiar and (presumably) well-liked music with novel acts, in a way large numbers of people can easily access in the course of their daily lives. It can be difficult to accomplish this through other conventional means of self-promotion: playing concerts, perhaps as an opening act, or by sample giveaways at music festivals or record stores. These methods can be expensive and time-consuming, though they are more likely to connect esoteric acts with fans that might enjoy them — certainly more so than broadcast radio. Fortunately, new technologies are providing opportunities for artists to connect with fans in far less expensive, and potentially far more personalized ways.

Even new broadcast media, like satellite radio, make hundreds of channels available to a given location, rather than the ten or twenty found in the conventional broadcast spectrum.²⁴⁷ With Internet radio, essentially anyone who chooses to become a webcaster can be heard by anyone who chooses to listen. Online broadcasting already encompasses thousands of stations, including simulcasts of conventional broadcasters from around the world²⁴⁸ and a few million listeners.²⁴⁹ With these new capabilities, many little-known bands should find themselves on *someone's* playlist next to similar more popular acts. Listeners tuning into a station that caters more closely to their personal tastes than their local conventional radio stations are more likely to discover these acts serendipitously.

Bands can (and have)²⁵⁰ also set up web sites, or even webcasts, themselves, to promote their music, though drawing attention to a stand-alone site is a challenge unto itself. A better solution is to upload sample tracks (or entire repertoires) to an “aggregation” site, like MP3.com, EMusic.com, Vitaminic.com or the Internet Underground Music Archive (iuma.com) (or maybe even a MusicNet or PressPlay affiliate). Users can search collections of obscure music by genre; in some circumstances, these services even pay dividends to artists.²⁵¹ Successful bands can also sell CDs over the Internet, either with a major retailer like Amazon.com, or with an independent site.

Some users may enjoy spending hours and hours browsing through online music catalogs, looking for quality music they actually like, perhaps trying genres with high concentrations of music they already own. But most people would rather start with music that many other people have listened to and also liked, or music that has been recommended to them based on their personal tastes. After all, people have been getting music advice from acquaintances and friendly store clerks for decades. Innovative digital systems have already been created which attempt to integrate automated but personal recommendations with the convenience of a radio broadcast or a personal music collection.

The MIT Media Laboratory and its failed FireFly technology pioneered what is known as “collaborative filtering” — recommending a new song based on the fact that other people (whose other preferences overlap substantially with the customer) also like the same song or set of songs.²⁵² More successful systems include Amazon.com’s famous collaborative recommendation engine (which is based on previous customer’s buying patterns) and MSN Music’s radio station recommendations, based on mood or favorite artist. More sophisticated automatic techniques often include audio analysis techniques which attempt to quantify each track in dimensions like tempo, pseudo-mood, sub-genre, and other fuzzy metrics, in order to improve the quality of recommendations. Lesser known systems that make recommendations based on the user’s personal MP3 collection include the Relatable²⁵³ technology inside the free MP3 software player FreeAmp, the moodLogic player²⁵⁴, and the KaZaA plug-in for the WinAmp MP3 player.²⁵⁵ (Relatable is affiliated with both EMusic.com and Napster, the latter of which has also acquired the venerable collaborative music search engine Gigabeat.)²⁵⁶

Merging artificial and natural intelligence, Media Unbound combines collaborative filtering, sound analysis, and input from music experts with some initial input from the user to literally

create a personalized “radio station.” Salon’s Janelle Brown, who tried a demo of the system, said the playlist created for her was “perfect,” including bands she knew that “perfectly epitomized my rock tastes” as well as “obscure bands I had never heard of before, but which I discovered that I liked....In just half an hour, Media Unbound managed to convince me to investigate 10 new bands that I never would have heard on the radio.”²⁵⁷ Musicmatch.com now sells a similar service.²⁵⁸ Garageband.com is another “digital music aggregator” that has constructed a business model around collaborative filtering, though it does not provide personal recommendations. It invites recording artists to use its site for self-promotion, including MP3 sampling, announcements about live performances, and CD sales. Web surfers are offered free pickings from most of the site’s CDs in return for reviewing samples of music they have likely never heard before.²⁵⁹ The results of these ratings are compiled into rankings; top artists are offered a relatively conventional record company contract with the operators of the site.²⁶⁰ Garageband presents its music in such a way that listeners can download MP3s of the songs they hear, skip songs they don’t like, and learn more about the bands they are listening to. This system provides a vehicle for obscure bands to gain notoriety, reduces costs and risk for the record company, and gives a means for consumers to discover new music that their fellow listeners (as opposed to record company executives or radio DJs) have “pre-approved.”

On a crude level, the trend toward customization in online music mirrors the shift from broadcast to cable services in the television industry. In fact, MusicNet’s president and CEO, Alan McGlade, helped pioneer an innovative music video cable channel called The Box. It allowed viewers to phone in and request their favorite videos; customers in different areas would see different selections based on the requests of their neighbors.²⁶¹ Digital *video* distribution is the subject of the next chapter.

5 In Comparison — Digital Video Distribution

The digital video distribution industry has not experienced much that compares with the dramatic rise and fall of Napster, and general online consumer participation in this industry remains low. Historically, motion picture technology has had less time to accrue complicated legal regulations, and has proven more difficult to adapt for the Internet age. This chapter takes a similar approach to the last one, starting with a legal primer, and then exploring the struggle to popularize innovative technologies and find sustainable business models.

5.1 U.S. Copyright Law as It Applies to Motion Pictures

In the abstract, copyright laws concerning video, or “motion pictures” as the statutes refer to the technology, is substantially similar to audio-related regulation. Permission of the copyright owner is required to copy video footage, or to make use of it in a subsequent work in a way not allowed by fair use. There are still the cross-cutting exceptions for fair use, classroom use, libraries and creation of special versions for the blind. (See section 4.1.1.) “Special interest” provisions, such as those for religious and veterans groups in audio rights, have not accrued in motion picture law.

Unlike audio recordings, all public performances of motion pictures, including the display of individual frames, require permission,²⁶² and rental is allowed *without* permission.²⁶³ Embedding an audio work in an audiovisual one — using a song in a movie, for instance — is considered to be making a “derivative work,” so permission of copyright owner of the music is required. The Harry Fox Agency acts as an intermediary for this type of license.²⁶⁴ Just as there are laws which deal separately with terrestrial, cable, and satellite radio, for example, a number of statutes codify specific practices and rights (including limited copying and rebroadcasting privileges) in the terrestrial broadcast television, cable television, and satellite television industries.²⁶⁵ There are no statutory licenses, except for public broadcasting²⁶⁶ and satellite rebroadcasts.²⁶⁷

5.2 Practical Considerations

The reason moving picture technology has been difficult to adapt for the Internet age, as I claimed at the outset of the chapter, is primarily a problem of bandwidth. MPEG compression

standards (of which the MP3 format is one) exist for video signals, but the amount of information they must encode is fundamentally much greater. Typical MPEG-encoded, TV-quality video segments take up about about 36 MB for each minute.²⁶⁸ At this rate, a four-minute music video (144MB) would take almost 6 hours to download on a 56Kbps modem, and about 34 minutes on a 560Kbps broadband connection. A two-hour feature film (4.3GB) would download in 171 hours over the modem, and 17 hours over the broadband connection. Equally important, a relatively fast PC (meaning relatively recent and probably not inexpensive) is required to render video at anything near TV quality; audio playback is considerably less computationally intensive. 95% of American Internet-using consumer are still using dialup modem services,²⁶⁹ and many of these disconnect from the Internet when they are not actively using network services, often because they use a household phone line for access. Because of these bandwidth limitations, downloading *any* video whatsoever for dialup users requires extraordinary patience, severely reduced picture quality, or both, if it is feasible at all.

A fairly wide variety of VHS and DVD-compatible movies are available for rental at the typical American corner video store, so people need not turn to the Internet for instant gratification when a craving for eye candy strikes. Far fewer, if any, *audio* recordings are available for rental. Though it is tempting to pin this on the fact that copyright holder permission is needed for audio rental, that law²⁷⁰ was passed in 1984 — most likely after the trend had already taken hold. Perhaps psychological and personal economic factors are actually more important; that is, it is not so much an impediment to profitable supply, but a fundamental lack of demand. It makes sense, for example, that most people would typically only want to see a given movie once, unless they are avid collectors, overly wealthy, or it happens to be one of their favorites. But people typically listen to music over and over again while they are doing something else, or when they are in a certain mood. There are also other supply-side problems unrelated to the legal situation. For example, it may be the case that because audio rentals would almost certainly have to be even cheaper than videos, “brick and mortar” merchants would not be able to make enough money to pay for their fixed costs (like rent and staff). Perhaps most importantly, it is very easy (and legal, under some circumstances) for customers to make reasonably good (if not perfect digital) copies of the rented music at home, which gives suppliers a strong incentive to sell rather than rent. Unlike CDs, it is very difficult for the average consumer to digitally copy DVDs, the new digital movie format, and all VCRs are now legally

required to scramble DVD input.²⁷¹ The problem with digital copying is not just the need for new, more expensive DVD drives and a very large hard drive connected to a PC, but also the built-in copy protection in the format (more on this later in the chapter).

In the online world, ongoing fixed costs are lower, and copy-protection schemes can drastically lower the incidence of unauthorized home copying of rented material. The medium is also considerably more amenable to casual home listening. Based on consideration of these factors, it is not surprising that MusicNet and PressPlay services essentially offer online “rental,” for less than a nickel a song. But remember that the relatively bandwidth-limited Internet distribution channel not only competes with rented and purchased DVDs, but also new technologies like interactive television (distributed by cable and satellite) and Digital Video Recorders, or DVRs. To put this industry in the context of the theory of change offered in chapter 3, consider Figures 5.1 and 5.2, which compare market penetration of various delivery technologies, including theater attendance.

Year	1980	1990	2000
Televisions	>99%	>99%	98%
VCRs	2%	70%	86%
DVD Players	–	–	15% (est.)
DVRs	–	–	<1%
Cable TV	18%	55%	69%
Satellite TV	–	?	10%
Computers	?	22%	66%
Internet	–	2%	54%
Broadband Internet	–	–	5%

Figure 5.1: Fraction of American households with certain content delivery technologies.²⁷²

Frequency of Attendance	Fraction of Population	
Never	26%	
Infrequent	10%	74%
Occasional	34%	
Frequent	30%	

Figure 5.2: Frequency of American movie theater attendance in 2000 (self-reported).²⁷³

5.3 Studios, Indies, and the Internet

The most traditional of these media are dominated by the seven corporations of the board of the Motion Picture Association of America. In many ways, these mirror the five companies of the Recording Industry Association of America, and in some cases the owners are one and the same. AOL Time Warner, Disney, Metro–Goldwyn–Mayer, News Corporation (which owns Twentieth Century Fox), Sony, Viacom (which owns Paramount), and Vivendi Universal each operate several movie studios, which together account for about half of all theatrical releases in the United States²⁷⁴ (compared to RIAA’s 85% market share).

In 2000, the average MPAA feature film cost about \$28 million to produce and another \$27 million was spent on publicity. That’s about twice the 1990 average, and almost six times the average cost of a major motion picture in 1980.²⁷⁵ Independent films financed out–of–pocket typically cost ten to twenty thousand dollars, perhaps a few hundred thousand or a million with financing from a small studio.²⁷⁶ Digital cameras, PCs capable of high resolution editing, and digital projectors have in recent years made possible significantly reduced setup, filming, distribution, and projection costs. New filmmaking technologies have also freed directors from some of the constraints of bulky conventional equipment, and made simple post–production tools, like color changes and lighting effects, accessible to the low–budget filmmaker.²⁷⁷ Even major studios might soon take the digital plunge; if theaters invest in new cameras and projectors, the industry could save perhaps \$300–\$900 million per year in copying and distribution costs,²⁷⁸ and prevent the degradation in quality that reel–to–reel prints suffer as they are shown over and over again.²⁷⁹ Currently, only about 10% of the films which are

independently produced each year enter theatrical release; the rest are relatively unavailable to the general public.²⁸⁰

The Internet represents a new, more “democratic” distribution channel, and a number of sites have sprouted up to aggregate freely downloadable (and legally posted) independent films. “Shorts” are especially popular; they are cheaper to produce, faster to download, and don’t require a large time investment. Independent digital *video* aggregation sites include Hollywood.com,²⁸¹ dScoop.com, The Bit Screen,²⁸² the sync,²⁸³ and microcinema.²⁸⁴ These sites are supported by advertising, cross-promotion, provision of content to other services, festival showings, or by enthusiastic hobbyists. The non-profit Internet Archive,²⁸⁵ which is supported by philanthropic donations, exhibits historic video ephemera to the public, among other services. IFILM,²⁸⁶ which is affiliated with Yahoo! Movies²⁸⁷ and is partly owned by Sony, uses its site as a screening tool for new talent; submissions provide content for its other sites and partnered subscription services. Using a more traditional commercial model, sightsound.com offers medium-quality “rental downloads” of its independent features for a fee. Finally, once again paralleling the recording industry, six of the seven MPAA members have split into two groups, which are in the process of launching competing subscription-based, video-on-demand websites.²⁸⁸ AOL Time Warner, MGM, and Viacom/Paramount will participate in Sony’s MovieFly;²⁸⁹ Disney and News Corp. plan to launch their service on Disney-owned Movies.com.²⁹⁰

If this trend continues, what will it do to the industry? The cynical argument is that big record companies and movie studios are only providing artists financing, in return for a large share of the profits, ownership, and potentially a good deal of creative control. Pauline Kael, in a famous *New Yorker* piece²⁹¹ ties the profit motive to problems meeting the social goals of quality, diversity, and creative freedom. In order to avoid risk, she says, established industry players tend to fall back on a strategy of formulaic plots, sequels, superstars, and lots of marketing hype, usually skirting excessive experimentation or originality.

To the extent that this might be true, alternative exhibition methods could circumvent the major studios and allow people (especially those outside cities with successful independent theaters) to experience a more diverse set of film shorts and features. Hundred-million-dollar budgets, though, pay for armies of animation and computer graphics artists and engineers, spectacular sets, wardrobes, special effects, superstar salaries, stunts, crowd and battle scenes, and other popular features of Hollywood’s synthetic reality. It is arguably beneficial for both

big-budget and independent filmmaking to co-exist, which, except for certain inequities in public exposure, they currently do.

Despite the potential of the Internet to remedy the publicity problem, even broadband technologies are insufficient to the task of providing high-quality video fast enough to woo American consumers away from their televisions and rented videos. Existing higher bandwidth delivery systems, however — including broadcast television, cable, and satellite — can be retrofitted with interactive capabilities. Unless there is a shockingly fast and unanticipated deployment of ultra-high bandwidth connectivity in this country, it is the potential for adaptation of older media that will likely have the biggest effect on consumers in the next few years.

5.4 Video on Demand

Cable television wires already carry dozens of uncompressed, TV-quality video streams into our homes, so it's no surprise that they can be repurposed for Internet broadband, a service which typically requires far less capacity. This conversion is accomplished by exchanging the passive conduits of the cable company's distribution backbone for an active Internet backbone with enough capacity to deliver packets to and from all the customers connected to a local loop. A small box in the home — the cable modem — talks to this new backbone over the existing lines, which are potentially also still delivering cable TV.

The same technique can be used to introduce interactive video services. Instead of shuffling Internet data, digital cable set-top boxes, routers, and dedicated company-side servers can be used to provide a service known as "Video on Demand" or "VOD." Essentially, all this means is that instead of tuning in at a particular time to watch a movie, customers can select the presentation of their choice through an interactive menu. From there, the set-top box works like a VCR, with pause, rewind, fast forward, and other familiar features. This is really not all that different from playing a video stream from a remote web server; VOD just uses dedicated cable lines and slightly different transmission and display technologies.

AOL Time Warner, owner of both the country's second largest cable television company (Time Warner Cable)²⁹² and the subscription channels HBO and Cinemax,²⁹³ has been experimenting with VOD. "HBO On Demand" is currently available to digital cable subscribers in five American cities, who can remotely access a weekly selection of the channel's movies

using a VCR-like interface, for a flat monthly fee.²⁹⁴ In conventional pay-per-view services, the viewer phones in to a central office, which then sends a signal to the individual set-top box telling it to de-scramble the appropriate channel at the appointed time. “On demand” services actually cause playback from the remote server to begin as soon as the user requests it. Time Warner Cable also offers “instant movie rentals” to some of its customers, in a sort of hybrid pay-per-view/on-demand service called “iControl.”²⁹⁵ Other cable companies have begun to offer similar services, for instance, Starz On Demand,²⁹⁶ available to Adelphia cable customers in Cleveland, Ohio, and Comcast customers in Willow Grove, Pennsylvania.²⁹⁷

5.5 Digital Video Recorders and Broadcast Television

If Video on Demand has the potential to preempt Internet video, Digital Video Recorder (DVR) technology has the potential to beat VOD to the punch. DVRs like the TiVo, SonicBlue’s ReplayTV, and Microsoft’s UltimateTV are in many ways like VCRs — they are set-top boxes that sit at the receiving end of broadcast, cable, and satellite signals, and consumers program them to record various programs. Instead of using cassette tapes, programs are recorded on conventional hard drives.

In one sense, hard drive technology is qualitatively very different from magnetic tape. But both have been around for a long time. Hard drive video storage may well prove to be a “disruptive” product, in the sense of Christensen;²⁹⁸ the differential *evolutionary* changes both technologies have undergone have resulted in a situation where digital storage may displace magnetic tapes in consumer electronics. In the case of DVRs, one technology in being swapped out in favor of another one which has a different technical ancestry. Most of the functionality provided is the same, but what might be considered *evolutionary* feature-set innovations may lead to *revolutionary* changes in the pattern of consumer use. All of this hinges on exactly what it is that people *do* with this kind of technology in the first place.

The three main uses people generally have for VCRs is to temporarily record programs they wish to view later (the “time-shifting” affirmed as fair use in the *Sony* decision), to permanently archive important or well-liked video, and to view pre-recorded material. DVRs, when used in combination with conventional VCRs and DVD players, still allow archiving and renting. What

they change is the ease of temporary recording, and in turn, how viewers might typically experience broadcast television.

Because the removable analog tapes of a VCR are replaced with a built-in digital hard drive and on-screen menus in the DVR, the hassles of buying tapes, figuring which ones are safe to record on, finding the desired tape in a pile of poorly labeled ones, and fast forwarding and rewinding to find the start of a program, are all eliminated. On-screen menus, fed by program listings provided by the service operator (sometimes for a monthly fee), streamline the process of selecting in advance which programs to record by eliminating the translation of paper listings into instructions for the VCR concerning the appropriate time and channel to record. (The VCR Plus system is one existing technology which uses special code numbers in printed listings to make programming easier, but it does not provide many of the other benefits of DVRs.)

In addition to simplifying time-shifting, new functionality is also enabled by the updated infrastructure. For example, DVRs have the capability to record programs associated in the provided listings with a particular word or phrase, to adapt to changes in program schedules, to record showings of a favorite program that the user did not anticipate, and to automatically record programs suggested by a personalized “recommendation engine” similar to those employed in the digital audio industry. Novel features like “pausing” live broadcasts, “instant replay,” and automatic, on-the-fly commercial deletion are made possible because hard drives can read and write different segments of the same program simultaneously. People who use DVRs are much more likely to watch pre-recorded content than people who use VCRs for several reasons. Many barriers to doing so have been eliminated, more features become available when they do, and there is a certain convenience in not planning the rest of one’s life around the television schedule.

The technology provides essentially the same functionality as video on demand, but currently features much greater selection of programming, wider availability, and greater consumer control. This provides strong competition for VOD on both cost (though buying a DVR is an investment of several hundred dollars) and functionality. If DVRs become as popular as VCRs (remember Figure 5.1) they may also threaten the viability of advertising-supported broadcast television. If large numbers of people watch broadcasts on a short delay, or at another time altogether, they will likely skip commercials. The ReplayTV can even delete them automatically, in advance.²⁹⁹ Broadcast television is profitable only because large numbers of people are

exposed to the commercials; if a significant fraction of the population is no longer seeing them, this will seriously reduce their value as measured in dollars. On the other hand, because the device records economically valuable information about personal viewing habits and preferences, it creates entirely new markets. TiVo, for instance, exploits the information it collects about the programs its subscribers watch and enjoy, and which commercial they skip, though it does not correlate these with customer contact information.³⁰⁰

DVRs may also make it somewhat easier to make unauthorized (but potentially legal) copies of broadcast video. For example, there is an active hacker community which has developed the ability to extract program recordings from the TiVo.³⁰¹ The ReplayTV 4000 has the unusual capability to share recorded television programs over the Internet with other users (presumably friends and family) who have compatible models.³⁰² (Major television networks filed suit over this particular feature, as well as automatic commercial-deletion functionality, but dropped their complaints, most likely concluding that the courts would either declare these fair uses, or find that SONICblue was not liable for what infringement might be taking place.)³⁰³ The ReplayTV also *requires* a broadband connection, which positions SONICblue to become a Video On Demand provider, but over the slower Internet, rather than over cable lines. (On the other hand, if the DVR automatically time-shifts downloaded programming anyway, connection speed is less of an issue.) If commercial-supported broadcasting becomes less profitable, the result could be a shift toward subscription-based systems of all kinds. An additional hazard is the slated conversion of all U.S. television broadcasting to a digital format. The content industry companies are attempting to form a consensus around various schemes that would prevent consumers from making unlimited perfect copies of these broadcasts, but it is unclear how successful they will be.³⁰⁴

Broadcast television is still very much with us today, however, and the entrenched interests there have been fending off competition from new distribution channels for low-fidelity versions of their signals. For example, recordTV.com, which allowed consumers to use the site's servers to record television signals and view them at a later time, was shut down after an MPAA lawsuit.³⁰⁵ The Canadian site iCraveTV.com, which re-broadcast live television signals over the Internet, was also forced to discontinue service after an American federal court injunction prevented it from "leaking" these signals back into the United States.³⁰⁶ JumpTV now intends to offer a similar service, and like iCraveTV, it claims to be legal under Canadian law as long as royalties

are paid to a central fund. Unlike the previous venture, JumpTV intends to implement strong technological restrictions to prevent American viewers from accessing the site; it intends to support itself through advertising.³⁰⁷ The MPAA is interested in blocking services like these because broadcasters can presumably get higher advertising rates if they “target” their signals to particular regions, rather than, say, Internet viewers in general. Movie studios would, in turn, suffer lower royalty payments as a result. Persistent copies of broadcast shows — which would not carry “fresh” advertisements — are yet another concern.

5.6 DVDs and Anti-Circumvention

The movie studios also protect profits by separating customers into targeted groups. DVD “region codes” divide the world up into several zones; a player designed to work in one region will not play discs designated for a different one. Anime fans who buy DVDs from Japan (Zone 2) will not be able to play them on conforming American (Zone 1) boxes. Studios sell theater and retail distribution rights to different countries separately, and prefer to release new films in stages. So Australian (Zone 4) movie fans may want to raid Amazon.com for DVDs of films that have not yet made their theatrical debut *Down Under*, but would be unable to view them with locally manufactured players that respect these lockouts.³⁰⁸ This practice has attracted the attention of both the European Commission³⁰⁹ and the Australian Competition and Consumer Commission.³¹⁰

These annoyances can be easily circumvented by devices which ignore the region codes, but in the United States, this is now illegal. The Digital Millennium Copyright Act prohibits the circumvention of any “technological measure” that controls access to any copyrighted work.³¹¹ It also made it a crime to sell or otherwise provide anyone else with any technology or service that is primarily promoting, designed, or used for the purpose of such circumvention.³¹² This is a very strong piece of legislation that gives a powerful legal tool to publishers who use technological “self help” to prevent unauthorized access or copying. Unfortunately, it also prevents users who might have legitimate reasons for doing so — for example, to make backup copies, or to unlock a public-domain work — from having the necessary tools and (for getting access in the first place) the legal right to do so. The law does grant certain narrow exceptions for libraries and educational institutions, reverse engineering to achieve technical interoperability, and encryption

research, but the scope of these exceptions, as well as the appropriateness of the anti-circumvention law in general, is currently the subject of heated court battles.

A given DVD, at the discretion of the producer, may have up to seven different systems (not counting region codes) which, in concert with playback equipment, attempts to thwart unauthorized copying. However, many of these schemes require the cooperation of the playback equipment.³¹³ Given a DVD-ROM drive, a PC, and some technical sophistication, all of these systems may be easily circumvented, except one — the Content Scrambling System. CSS is essentially a system of encryption; the keys necessary for *decryption* are supposed to be secrets kept by the hardware chips of licensed DVD players. There are no licensed software or hardware players for many computer operating systems, so Linux users, for instance, cannot play even legally rented or purchased DVDs on their computers. At least, they could not until CSS was cracked in 1999;³¹⁴ various “DeCSS” programs that unlock the encryption have been available on the Internet ever since. Technolibertarians are fond of emphasizing that these systems can be used to achieve “interoperability” with non-mainstream operating systems, but DeCSS tools can also be used to make pirated copies of DVDs playable.³¹⁵

Among other litigation,³¹⁶ the MPAA sued 2600 (a Technolibertarian hacker’s magazine and online publication) and various other individuals and organizations for violating the DMCA by posting copies of DeCSS on their web sites. The federal Second Circuit Court of Appeals upheld a permanent injunction against posting copies, or even linking to other web sites that post copies.³¹⁷ The court ruled that because the anti-circumvention provisions are “content-neutral,” serve a “compelling government interest,” are “narrowly tailored,” and target the *functional* aspects of the software (rather than its *expressive* aspects) they are not invalidated by the Constitutional protection of free speech.

Technolibertarians the world over have mainly ignored this decision, and have taken up posting and reposting DeCSS code as acts of civil disobedience. One college professor has posted an entire gallery of DeCSS links, in an effort to illustrate the speech-like nature of computer code.³¹⁸ Others have repeatedly emphasized that the DMCA is being used as a tool to effectively — by taking certain technologies away from the public — deny people the ability to make certain “fair uses” as they would otherwise be entitled. These campaigns are unlikely to affect judicial opinion on such matters, which will likely continue to uphold Congress’ authority

to regulate technology in this way (though as of this writing, the Supreme Court has yet to examine the issue).

5.7 DirecTV's Victory in the Technical Arms Race

Whether or not the anti-circumvention provisions survive the test of further judicial review and future public scrutiny, they do currently represent a major victory for the Intellectual Property camp and the strong pro-privatization of information — at least in theory. You may at this point have the impression that while content-based corporations may prevail in court, they are vastly outgunned in the matter of practical enforcement. I have already mentioned third-party “bounty hunter” agencies that in theory, could step in and round up scofflaws. But let me leave you with one last example showing that at least one company (albeit one that had the benefit of special hardware) did possess the will, financing, and technical expertise to win at least one battle in this hacking war.

DirecTV equips its satellite receivers with special computer chips which are designed to decrypt only the channels that the owner of a given receiver is authorized to view. Enterprising hackers found a way to re-write the on-board software in these chips in such a way that they could view all the channels, whether or not they had paid for them. The company could send software updates via its broadcast signal; it occasionally used this capability to change the encryption scheme it used and thus render the hacked chips useless. However, the hackers would merely re-program their devices, and continue to receive free satellite TV. On January 20, 2001, DirecTV completed an ingenious series of rapid-fire changes to their software. Hackers applied their own code changes to compensate, and in so doing, an estimated 98% of them triggered the built-in self-destruct feature, which physically destroyed their altered cards. The DirecTV team signaled its victory by electronically writing the words “GAME OVER” in the first eight bytes of the devices’ memory.³¹⁹

6 Analysis and Projections

6.1 Social Goals and Systems

In section 2.3, I outlined some broad social goals concerning the creation of intellectual content. Now, with the benefit of the intervening case histories, allow me to re-iterate these goals in greater detail, rearranged into the following three groups:

Compensation

- Creators are compensated for their work, creating an incentive and improving their ability to constantly produce more and better material.
- The amount of compensation is “fair”; in other words, it reflects the actual costs of creation in both materials and human attention, plus the social utility of creating content rather than something else.
- Allocation is determined democratically, giving artists an incentive to create works which will be popular.
- Collection of compensation puts minimal friction on the creation of new works and the advancement of science, technology politics, art, and culture.

Diversity

- Producers retain creative freedom, giving them the opportunity to create potentially controversial or contemporarily unpopular works of high quality or importance.
- Content produced does not solely cater to what is most popular; a wide diversity of preferences (and hence producers) are represented.
- There are one or more successful means of publicizing the full diversity of works to interested parties.

Innovation

- New technology which improves how content is discovered, delivered, enjoyed, used, and paid for should not be suppressed or impeded, but supported.

I have described a number of technologies (various means of Internet-based distribution, collaborative filtering, digital cameras and editing, etc.) which reduce the costs of production, dissemination, and discovery. These free up more money for artists themselves, and both directly and indirectly enable a greater diversity of content to reach the people most interested in receiving it. I also mentioned a few self-interested behaviors which have become norms in certain communities. For example, many college students are perfectly willing to download content off the Internet without paying the people who created it.

I have not yet attempted to explore certain other, harder to understand cultural and psychological effects. For instance, some people simply enjoy creating things like music, pictures, movies, or other art forms, and will do so even if there are no material rewards. The Internet is strewn with sites created by people who post information or creative works as part of a hobby. Some online services are provided by people who have personal causes, who like the idea of helping other people in some way, or who enjoy the recognition and gratitude that follows. Some people *do* give money rather selflessly to public broadcasting or their local symphony orchestra or theater group, even if they could personally receive the same services at lower or no cost. These kinds of behavior may complicate theoretical economics, but they also suggest new funding mechanisms for intellectual content.

6.2 Economic Models

On the subject of compensation, the case studies in chapter 3 unearthed a number of relevant economic models. I have combined these with a number of other schemes, and roughly divided them into four groups: voluntary contributions, propertization, profiteering, and public funding.

6.2.1 Voluntary Contributions

Many content creators, especially artists and musicians, *don't* make enough money from their work to support themselves. Many of them have “day jobs” and play music, make amateur movies, write books, hack on software, or post things to the web in their spare time and on their own dime. A great deal of the available content on the web now is created by hobbyists, and though as a whole it may be unorganized, this does not mean that one cannot find useful and entertaining³²⁰ information. For example, in preparing the motion picture case study, I have

personally relied on the DVD FAQ³²¹ (a FAQ is a list of “Frequently Asked Questions” and corresponding answers), part of the collection of Usenet FAQs,³²² all created by volunteers. Other prominent information-gathering efforts include DMOZ,³²³ an Open, human-edited web directory, and several Open Encyclopedia efforts.³²⁴

All of this activity in the absence of financial compensation underscores tends to validate the application of the tools of Information Freedom. The GNU Foundation proudly points to a 1987 Boston Globe article which summarizes psychological evidence that when it comes to creative endeavors, “intrinsic” rewards, or self-motivation, produce higher-quality work than “extrinsic” rewards, such as monetary compensation or approval of an authority-figure.³²⁵ The Free/Open Source software community certainly has its fair share of part-time volunteers, but not always for entirely altruistic or intrinsic reasons — not to mention the fact that a considerable amount of development effort is put in by companies seeking to benefit financially from their contribution in some way.³²⁶

Moreover, while the “labor of love” approach might work for relatively low-budget creative endeavors like music, mutually beneficial projects like software, or the independently wealthy (and their benefactors) it does not work well at all for other purposes. For instance, scientific research, professional journalism, and big-budget film-making would all be severely curtailed without the funding for full-time staffing and expenses like laboratory equipment, travel, and special effects.

In any case, expecting creative people to bear all of the burden of supporting themselves, in addition to donating their time and energy to their work, seems unfair. It’s an accepted notion that when we encounter a musician, magician, or comedian on the street, if we stop and enjoy the performance, we should contribute something to the pile of cash which generally accumulates inside a hat, jar, or instrument case. This may not fit well with a rational economic analysis based on assumed self-interest,³²⁷ but it is what people do.

Well-known projects which benefit from both volunteerism and donated funds include the Free Software Foundation³²⁸ and Project Gutenberg, which posts electronic copies of public-domain books on the Web.³²⁹ In combination with the wide availability of credit cards, so-called “micro-payment” systems like PayPal³³⁰ and the Amazon Honor System³³¹ help make it convenient and economical to donate small amounts of money to worthy endeavors providing free content on the Web.

Adopt A Band.com³³² is a volunteer effort that has collected over \$4,000 in PayPal donations for the artists it hosts.³³³ Fairtunes is an even more ambitious effort that seeks to repay artists whose works have been downloaded over the Internet without payment, or indeed, any worthy content creator. Its system is actually integrated into two popular (software) MP3 players, WinAmp (with download of a plug-in) and FreeAmp.³³⁴ It has collected over \$19,000 in 17 months of operation.

Soliciting donations is a tricky business, appealing to a sense of virtue as it does. People may be considerably less likely to donate if they are sitting alone in front of their computers than if they are in the middle of a crowd of people who are donating money in plain view of the artist. Despite the success of “peer-to-peer” music sharing systems like Napster and its successors, Fairtunes has generated a negligible amount of revenue compared to the typical CD sales of the artists it supports, including independents. It would certainly help if the service were better placed, better integrated, easier to use, and considerably better publicized. But the lack of overwhelming response is probably a commentary on whatever cultural currents have fostered the current acceptance (in certain circles) of rebellion against the music industry. People who “steal” popular music electronically often say they would be willing to pay for the same content, if only the terms were reasonable; the deals being offered by MusicNet and PressPlay, in the current climate, do not seem reasonable. Perhaps some people assume that artists who have chosen to post MP3s of their music up on the web must somehow be supporting themselves; more likely, they don’t really give the matter much thought at all, unless prompted. Whatever the reason, suggesting to artists that they live off of purely spontaneous donations does not seem to be a sustainable proposition.

While our capitalistic society is unlikely to convert to a “gift economy”³³⁵ in the foreseeable future, voluntary contributions can at least partially support expensive endeavors, if properly solicited. The public broadcasting industry, for instance, relies on individual donations for 26%, foundations for 6%, and business donations for 14.7% of its funding (though arguably the latter is a form of advertising).³³⁶ Notably, only roughly 10% of public radio listeners actually contribute funds.³³⁷ How does this work? Compared to say, Fairtunes, broadcasters enjoy large audiences, produce a product popular among their listeners, occasionally directly nag their listeners about contributing, and can express legitimate concern about decreasing levels of service if the money doesn’t keep rolling in. It is possible to implement contribution “reminders”

in software, as well, though both Intellectual Property and pure Free/Open Source models have been more successful in that industry than the “nagware” idea.

All in all, the biggest problem with any voluntary contribution model seems to be lack of effectiveness in generating funds. Cultural changes, more attention to the psychological factors governing contribution, or better general economic prosperity might make these some of these systems viable on their own, but unless a wealthy patron steps forward, supplementary sources of income are almost always needed.

6.2.2 Propertization

The opposite of a voluntary contribution model is essentially full propertization. Intellectual Property rights are usually used to grant access only to those consumers who pay for the privilege, except that some portion is may be made freely available for promotional purposes. This is by far the dominant model in all intellectual content industries, from movies to books; even some online newspapers.³³⁸

A few years ago, the most common fear about the coming digital age was that online services would increasingly be billed on a pay-per-use basis, because more fine-grained billing and access controls were becoming technically and economically feasible. If history is any indication, however, consumers will prefer flat-rate pricing, and it will be more profitable for providers to give it to them.³³⁹ Another theory was that ISPs might offer “all you can eat” portions of enhanced content to their users, in order to give themselves a competitive advantage over others who would be merely providing access to the free (as in money) Internet. This has happened to some degree; a quick tour of the “portal” pages for the large ISPs such as AOL, MSN, EarthLink, Prodigy, and Gateway,³⁴⁰ reveals a plethora of commissioned, strategically placed, and sometimes restricted-access content. Particularly concerning for the social goal of diversity in available content is the direct merger of ISPs with content-producing companies. The merger of AOL and Time Warner, for instance, warranted a consent decree with the Federal Trade Commission, in which the new company indicated that it would not engage in discriminatory conduct with regard to competing content.³⁴¹ Also notice that Microsoft, owner of MSN, populates its portal with news headlines from its joint venture, MSNBC.

Corporate consolidation has already negatively impacted both the diversity and of offerings in the music and movie industries, and the democratic allocation of compensation, as outlined in chapter 3, and as suggested by others.³⁴² Strong Intellectual Property rights are also inherently detrimental to the creation of new works and the advancement of science, technology politics, art, and culture. The requirement to tender payment before access is granted introduces a disincentive to draw from the experience of a large number of existing works, especially among the economically disadvantaged. Creativity may also be stifled because permission is usually required before using an existing work as part of a new one, or by improving it.³⁴³ In practice, strong propertization arguably results in the under-compensation of the majority of artists and the overcompensation of “inefficient” corporate intermediaries.

The case study in chapter 4 suggests that market forces (involving both consumers and artists), enabled by new technology, may improve diversity, reduce interference from intermediaries, and increase direct-to-artist compensation in the music industry. This may also happen to a lesser degree in the independent motion picture business, where equipment and production costs are usually much higher, and the inadequacy of Internet bandwidth retards these changes.

6.2.3 Indirect Profiteering

Through the Free/Open Source movement, the software industry has evinced the most dramatic partial adoption of the Information Freedom paradigm, with corresponding benefits for innovation and diversity, but concerns over compensation. There are certainly some inherent benefits to participating in distributed software projects. For instance, a given company or institution (or even an individual) may use an Open Source product to solve an internal problem, perhaps with community assistance. If those modifications are shared openly, the contributor will automatically receive the benefit of future improvements made by others, building on the new functionality.

Other means of obtaining funding for a project indirectly are also possible. Red Hat Software is a commercial distributor of the Linux operating system, which it, among others, makes available for free download. The company, which is just now beginning to become profitable, makes money by providing end-user support (and incidentally, instruction manuals and pre-

loaded CDs), custom software solutions, and consulting services to paying customers.³⁴⁴ It is successful at doing so largely because of the publicity and proof of technical expertise it gains from the popular Linux distribution it gives away to many people for free. Google and AskMe³⁴⁵ use similar “tech demo” strategies. Garageband.com is a reasonable parallel in the “creative content” world; it makes money by signing recording contracts with the most successful bands on its site.

Cross-promotion of physical merchandise is another indirect money-making scheme. For example, a free web site might be used to promote sales of CDs or books, or boost attendance at concerts, screenings, or exhibitions. Selling advertising is a tried-and-true method of generating indirect revenue, but it does not provide sustainable income if consumer attention is divided among too many publishers. Newspapers and broadcast media currently rely heavily on this model, but it seems to be supporting fewer and fewer web sites.

6.2.4 Public Funding

The federal government already directly funds a number of content-based industries through a number of entities, including the Corporation for Public Broadcasting, the National Endowment for the Arts, the National Science Foundation, the National Institutes of Health, the Department of Defense, the national laboratories, and local colleges and universities. The biggest danger of using public money to support research, news, music, plays, exhibitions, and other related activities, is the threat of political encroachment on creative and expressive freedom, through the selective (or threatened) reduction of funding. Another concern is whether or not the government will consistently provide a prudent level of funding, given other budgetary concerns.

The details of precisely how funding is awarded are in many ways removed from the legislative process and distributed among professionals in the appropriate fields. Broadcast producers pick what stories run on the news; university faculty by and large choose what to research, how to go about it, and select and edit articles for academic journals. Political whimsy becomes more problematic when it comes to coarser measures of control, like cutting overall funding or eliminating agencies altogether.

The introduction of digital distribution technology, with its reduction in publication costs, has increased accessibility to audio archives of news broadcasts and spoken-word cultural

programming, like those of National Public Radio. It is also making possible the free (for the consumer) exhibition of vast amounts of information. For instance, the University of Pennsylvania has collected a listing of over 15,000 books available online, most of them hosted at publicly funded institutions.³⁴⁶ The Massachusetts Institute of Technology has announced a project to make course materials for virtually all of its classes available for free online.³⁴⁷

Meanwhile, a fierce debate³⁴⁸ has been raging about the funding and availability of academic journals online. Instead of the traditional pay-for-access scheme, the new model would require *publishing* institutions, which are usually substantially supported by public funds, to bear the costs. Academics would still have incentives to support journals and to provide articles because decisions about institutional tenure and funding require active publication and acceptance by reputable peers. The system of peer review would obviously need to adapt so that articles could continue to be properly certified, and that would take time and institutional change. The point of making this change would be to put academic research results to better practical use in society at large, to speed further innovation by removing barriers to being well-informed, and to open access to economically disadvantaged individuals and organizations, especially in remote areas.

The growing digital collections of public libraries are another important trend. Many online journals and research collections are access-restricted, but university and other local libraries often have “site licenses” which enable members of the public who are physically present in the library (or who are online and properly authenticated as card holders) to have unlimited access.³⁴⁹ So even in a heavily propertized regime, the economically disadvantaged might still gain adequate access to research and entertainment resources through publicly funded institutions, if those institutions are properly provisioned and maintained.

By far the most democratic model for public funding of creative expression (despite the vexing assumption of some³⁵⁰ that public funding is completely and inherently dictatorial) is that provided by the Audio Home Recording Act. A directed tax on consumer audio recording equipment provides the funding; DJs and (paying) consumers allocate funding through decisions about what to play on the radio and what to buy in the store. Lawrence Lessig, among others, has suggested that this model be extended to all digital music downloads, including Napster-like systems.³⁵¹ Revenue could be generated by a tax on MP3 players, Internet access, and audio-capable computers, or in a more capitalistic alternative, by systems that generate profits through indirect means, which pay statutory royalties. Rewards might be allocated according to

popularity measurements taken by privacy-respecting software installed at central locations or on home computers, and audited by a neutral party. Revenue rates could even be adjusted from year to year based on the measured strength of consumer demand for new music.

6.3 Proposals for Legal Change

“Distorting the law and the technology of human communication and computing, in order to protect the interests of copyright holders, makes the world poorer overall.”

— *John Gilmore, Electronic Frontier Foundation.*³⁵²

Lessig’s proposal is not the only one which seeks to facilitate competition in the online music industry. In August, 2001, Congressional Representatives Chris Cannon of Utah and Rick Boucher of Virginia formally proposed a bill called the Music Online Competition Act. The Act would prevent major record companies from cross-licensing their catalogs only to each other; all copyright owners would have to offer equal licensing terms to all distributors, including independents. The measure, though it might help make available a more diverse set of music, and increase competition in the industry, is obviously unfavorable to the major labels, and so faces strong resistance from that quarter.

As the title might imply, Lessig’s *The Future of Ideas* is primarily concerned with the detrimental effect of over-regulation and over-properitization on innovation. In the case studies of chapters 4 and 5, I described a number of new devices and new use-patterns, like portable MP3 players, DVRs, and collaborative filtering. In her own book, Litman cites a number of historical examples where innovation and improvement was spurred because property rights were *not* reserved to the copyright holder, creating, in Lessig’s terms, a partially “unowned” resource:

“Player piano rolls became ubiquitous after courts ruled that they did not infringe the copyright in the underlying musical compositions; phonograph records superseded both piano rolls and sheet music with the aid of the compulsory license for mechanical reproductions; the jukebox industry arose to take advantage of the copyright exemption accorded to ‘the reproduction or rendition

of a musical composition by or upon coin-operated machines.’ Composers continued to write music and found ways to exploit these new media for their works. The videotape rental business swept the nation shielded from copyright liability by the first sale doctrine. The motion picture industry predicted that if Congress failed to rush in to correct the problems posed by the invention and marketing of the videocassette recorder, American television would be slowly destroyed, and American motion picture production would sustain grave injury.... Notwithstanding all the gloom and doom, however, both the motion picture and television industries discovered that the videocassette recorder generated new markets for prerecorded versions of their material. Cable television began spreading across America with the aid of a copyright exemption; it eclipsed broadcast television while sheltered by the cable compulsory license. Yet, there is no dearth of television programming...³⁵³

One of the largest copyright-related barriers to building on or innovating with existing works,³⁵⁴ aside from the expansive scope of propertization, is the duration of protection. Copyright for new works lasts for life of the author plus 70 years, or 95 years for corporate-owned works. Financial benefits which accrue only after the death of the author clearly have questionable influence on the “incentive to create.” Most of the value found in intellectual property holdings is usually extracted in the first decade after publication.³⁵⁵ For instance, the typical feature film will accumulate three-quarters of its eventual revenue in the first 14 months after its release.³⁵⁶ Rare exceptions include “classic” works which endure in popularity for many years; though arguably, there is much more social value in de-propertizing these than allowing their owners to retain tight control.

In the closing pages of *Ideas*,³⁵⁷ Lessig offers a laundry list of improvements to copyright law which seek to address the harms of over-propertization, without diluting the relatively strong rewards for creators. This list includes the following copyright-related provisions:

- Grant copyright in five-year renewable terms, up to the current limit, for published works.
- Require registration before copyright protection is granted.

- Use the Copyright Office web site to facilitate registration and renewal.
- Charge registration and renewal fees so that property rights are retained only if there is considerable value in doing so.
- Software source code to be escrowed with the Library of Congress.
- Grant current protections to unpublished works.
- Grant tax benefits for the donation of existing works (which would keep their current protections) to the public domain.
- Only enforce the anti-circumvention statutes if the protective technology in question “provides for fair use.”
- Grant compulsory license terms for works which are not being commercially exploited by their owners.

Patent reform is also at the top of his legislative agenda — and rightly so, especially in the fast-innovating online world — though I have not explored why in this thesis. Finally, he argues for allowing, as a defense against accusations of copyright infringement, the fact that a new use does not harm *existing* markets. For instance, in the MP3.com case, customers had the choice of either using the company’s service to listen online to music they already owned, or to manually transfer their own collections. In either case, they would still have to buy a CD in the conventional manner, so the existing market for recordings could only be helped by the service. But MP3.com was profiting from a service that the copyright owners *might* choose to offer themselves — though they had not done so — and thus was depriving them of *potential* revenue. This tipped the balance of fair use against MP3.com; Lessig’s defense would help companies like it prevail against non-innovative entrenched interests in the future.

6.4 Projections and Conclusions

In *Digital Copyright* Jessica Litman offers an even more radical solution to the same problem: a wholesale re-write of Title 17. Litman would change the “copy right” into an “exploit right” — all non-commercial uses would be allowed, unless they created “large-scale interference” with the owner’s potential of commercial exploitation.³⁵⁸ (She also proposes creating various consumer and author rights, including making temporary copies in order to read,

citation, access to works in the public domain, and truthful labeling in adaptations.) This would upset the intricate set of compromises currently enshrined in the statutes, but would arguably both re-align the law with popular values and make the law much, much easier to understand.

For better or worse, the Digital Millennium Copyright Act passed Congress with near unanimity. Unless unforeseen events intervene to change the political situation, the content industries will continue to maintain their long-standing influence over Congress in these matters, and the law will not change in any way that substantially threatens their interests. Nor is the government at all likely to adopt the extreme Security Systems Standards and Certification Act (SSSCA),³⁵⁹ which would require embedded copyright compliance mechanisms in all computers and electronic equipment. It would not only be costly and quite controversial, but it is opposed by equally powerful business interests.

The domains of business and technology, on the other hand, are more fluid. Various economic models, both legal and otherwise, are being experimented with. The technical “arms race” continues between hackers and protective content owners.³⁶⁰ Legal content distribution systems may prevail in these contests, either because they offer the services that consumers want, or because people find it easier to pay up than to “pirate,” even if strong anonymity is available in systems like Freenet. On the other hand, there may always be *some* level of illegal copying, and consequently perhaps some amount of enforcement action. If my predictions about the music and motion picture industries hold, a diversity of independent artists could well flourish there in the near future, and consumer may see find interesting content available at lower prices.

On the other hand, we have already seen an increase in the use of “self-help” — technological barriers to unauthorized copying and access. Consumer reaction to these systems and the ability and interest of hackers to technically circumvent them (and not get caught) will primarily determine how much protection is cost-effective. It is unclear as of yet which industries might tolerate significant amounts of unauthorized copying but remain profitable (like the software industry has for many years) and which might crack down harder or bottle up tighter, at the risk of alienating customers.

Consumers do hold the power of the purse over content-producing corporations, but selective abstinence seems to be an unpopular approach. One Slashdot community member responded to the suggestion that boycott “is the is the only lawful, moral and ethical way to cause them financial harm”³⁶¹ with the following post:

“Considering that the MPAA/RIAA doesn’t listen to reason (look at the 2600 suit), we can’t bribe them (they’re already rich), we can’t threaten them with legal action (they can afford lawyers, we can’t), what other form of persuasion is left to us besides theft?”³⁶²

“rjh” then went on to advocate selective theft of only copy-protected movies, providing a measured and somewhat civil message to the movie studios to change their ways. Hardly anyone, it seems, is actually heeding this advice, nor does it apply very well to the music industry. The vast majority of content carried by file sharing systems on the contemporary Net are illegal copies of popular CDs, hardly any of which are copy-protected in the first place. The trading of movies online is, as I have explored in detail in chapter 5, much more inconvenient.

The civil disobedience of Technolibertarians, perhaps aided (intentionally or otherwise) by the casual and perhaps not unjustified disregard for copyright law many Americans seem to share, is a way of forcing the issue of whether or not a legal regime that favors “self-help” is an acceptable alternative for copyright owners. As Litman points out, if enough people ignore the law, at some point, it may become necessary to find a new set of rules that more people find acceptable.³⁶³ This might mean that the sort of changes suggested by Lessig and Litman might one day become politically feasible. But it might also make more conceivable the adoption of stronger enforcement methods, like those proposed in the SSSCA. Lessig considers civil disobedience “risky and increasingly costly,” and worries that it reinforces the philosophy of Intellectual Property. He writes on Slashdot:

“Copyright hoarders demand increasingly extreme rights so that they may exercise almost perfect control over how their content gets used. In response, the civil disobedience movement sends a message that they should have no control over how their content gets used at all. Between perfect control and no control, most would choose perfect control. And hence, we lose.”³⁶⁴

I won’t speculate either way on the issue, but I will reiterate that there are perfectly legal ways that average people can influence the changes our society is experiencing. People can educate themselves about the many content offerings already available to them, and then decide whether they want their money supporting the established interests and the status quo, or

something different. They can boycott companies that don't give them what they want, and they can, if enough people actually take the time and energy to do so, put real pressure on elected officials to improve the law to better serve the public interest. Artists, programmers, businesspeople, and investors, can choose what kinds of technologies, business models, and creative content to support with their skills and attention. People can compensate substantially for the social inadequacies of the current heavily propertized regime by supporting their local public libraries with individual and public resources.

In closing, I hope that academics, professionals, journalists, programmers, and citizens will find the techniques and facts I have collected here useful in achieving a more nuanced and holistic understanding of the forces which mediate social and technological change. It will also be interesting for me personally to see whether or not history will continue to unfold as I expect it will, and to apply the insights I have gained through this project to related problems.

A Note on Sources

Many of the sources I cite are on the World Wide Web. A special concern for electronic sources is that they may disappear without warning. However, one of the projects I mention, the Internet Archive, has engaged in the ambitious task of maintaining a permanent copy of every web page their crawler can access. You may find their site, at <http://www.archive.org> to be helpful in digging up intact copies of downed web pages.

For those of you not familiar with legal citations, the notation “USC” refers to the United States Code. The preceding number refers to the title (for my purposes, always Title 17, which is the main collection of copyright statutes) and the following numbers refer to sections and subsections. (I have ignored chapters and subparts, in order to remain sane.) As of February, 2002, you can find the U.S. Code online at <http://www4.law.cornell.edu/uscode/>. The U.S. Copyright Office provides a more concise summary of copyright laws, regulations, and other matters at <http://www.loc.gov/copyright/>. I am less familiar with case law citations, but many recent decisions, including almost all of those I reference, are also available online. I have found that the best general starting place for locating many types of legal documents is FindLaw <http://www.findlaw.com>.

Endnotes

1. Valenti, Jack. Testimony before the Senate Judiciary Committee, cited in MPAA press release, April 3, 2001. "VALENTI WARNS OF POTENTIALLY DEVASTATING ECONOMIC IMPACT OF COPYRIGHT THEFT." <http://www.mpa.org/jack/2001/2001_04_03a.htm>; accessed 26 Jan 2002.
2. DiBona, Chris. "Free Speech, Free Sklyarov / A Community Declaration." <<http://www.dibona.com/dmca/>>; accessed 26 Jan. 2001.
3. For example, in *Science at the Bar* (Harvard University Press, 1995), Sheila Jasanoff touches upon DNA testing and judicial process; the need to regulate public hazards like pollution, electrical devices, nuclear power plants, and airplanes; and medical technology, malpractice, abortion, and the end of life.
Susan Douglas (*Inventing American broadcasting*. Johns Hopkins University Press, 1987, pp. 216–322) has an excellent history of the early regulation of radio broadcasting, which parallels Jessica Litman's history of twentieth century copyright (see section 2.2).
In the digital realm, collision has occurred in several areas in addition to intellectual property, including: privacy, freedom of speech, the use of cryptography, national sovereignty, and commercial practice. See:
Lessig, Lawrence. *Code and other laws of cyberspace*. Basic Books, 1999.
"6.805/STS.085 Readings and Source Material." 25 Nov. 2001. <<http://www-swiss.ai.mit.edu/6.805/readings-general.html>>; accessed 5 Feb. 2002.
"6.805/STS.085 Student Papers." 25 Nov. 2001. <<http://www-swiss.ai.mit.edu/6.805/student-papers/student-papers.html>>; accessed 5 Feb. 2002.
4. Mencken, HL. *In Defense of Women*. 1918, rev. 1922; p.158. Cited at: <<http://www.io.com/gibbonsb/mencken/megaquotes.html>>; accessed 1 Sept. 2001.
5. Lessig, Lawrence. *Code and Other Laws of Cyberspace*. Basic Books, New York, 1999; pp. 85–99, 235–239.
6. Lessig, Lawrence. "The Law of the Horse: What Cyberlaw Might Teach" *Harvard Law Review*, 1999, Vol. 113:501–546. Also available at <<http://cyber.law.harvard.edu/works/lessig/finalhls.pdf>>; accessed 3 Feb. 2002.
7. The general relationships between technical and social factors are best understood by examining case studies. Particularly illuminating is *Inventing Accuracy* by Donald MacKenzie (MIT Press, 1990), which chronicles the development of nuclear missile guidance technology. Some interesting student case histories in this tradition include "HDTV: The Engineering History" by Alvarez, Chen, Lecumberri, and Yang (10 Dec. 1999, <<http://web.mit.edu/6.933/www/HDTV.pdf>>, accessed 27 Jan. 2002) and "The Story of Mode S" (an airline anti-collision technology) by Chang, Hu, Lai, Li, Scott, and Tyan (15 Dec. 2000, <<http://web.mit.edu/6.933/www/Fall2000/mode-s/mode-s.pdf>>, accessed 27 Jan. 2002). "Technical determinism" is the preferred term for the fallacy that technical necessity alone shapes future development. It should also be obvious that the parallel fallacy, "social determinism" or "social constructivism," is also false. A government, organization, individual, or society cannot simply and immediately will into existence an arbitrary technology, no matter how politically or economically powerful it might be; all human activities are constrained and affected by the physical world. (The aforementioned case studies may also be illuminating on this point.) On the general point of understanding "multi-determined" systems, I have found R.C. Lewontin's *Biology as Ideology* to be quite thought-provoking. Lewontin attacks the similar fallacies of genetic determinism and biological determinism, analyzing the conflicting forces of *nature* (genetics and innate biology) and *nurture* (environment and experience) in a way reminiscent of Lessig's four modalities.
8. Thomas Kuhn's *Structure of Scientific Revolutions* (University of Chicago Press, 1962), a seminal work in the history of science, makes a successful analysis along lines which are orthogonal to Lessig. Rather than speaking of interacting modalities, Kuhn explains the history of scientific knowledge in terms of various competing schools of thought, which experience phases of revolution and evolution. One might construe this as a special interaction of science/technology with scientific "culture" — but this would be missing the point. This is not to say that the understanding of such events cannot be informed by the additional consideration of economics, politics, etc. In fact, this is essential in some cases (see note 7, above).
9. I am grateful to Jessica Litman's book (see note 13); "Music and Money: Where The Money Comes From For Writers and Publishers" by Todd Brabec and Jeff Brabec <<http://www.ascap.com/musicbiz/music4money>>.

Endnotes

- html> accessed 6 Oct. 2001; and Title 17 of the U.S. Code for helping me hit all the bases in these examples.
10. 17 USC 201(d).
 11. 17 USC 201(b).
 12. Lessig, Lawrence. "The Limits of Copyright." *The Industry Standard*, 19 Jun. 2000. Also available at <http://www.thestandard.com/article/0,1902,16071,00.html?body_page=1>; accessed 29 Jan 2002.
 13. Litman, Jessica. *Digital Copyright*. Prometheus Books, 2001. (Hereafter *Digital Copyright*.)
 14. *Digital Copyright*, pp. 122–150.
 15. *Digital Copyright*, p. 126.
 16. Lessig, Lawrence. "Building a Commons." Keynote address, The Berkman Center's "Building a Digital Commons." May 20, 1999, Cambridge, MA. Draft version 1.01. <<http://cyber.law.harvard.edu/events/lessigkeynote.pdf>>; accessed 2 Feb. 2002.
 17. *Digital Copyright*.
 18. *Digital Copyright*, p. 78. Footnote removed, emphasis added.
 19. *Digital Copyright*, p. 78. Emphasis added.
 20. *Digital Copyright*, pp. 80–1. Emphasis added.
 21. <<http://www.arstechnica.com>>; accessed 29 Jan. 2002.
 22. Stokes, Jon. "Intellectual Property and the Good Society: A Structural, Outcome–Oriented Approach" Begins at: <<http://www.arstechnica.com/wankerdesk/01q3/ip-ethics/ip-ethics-1.html>>; accessed 29 Jan. 2002. (Hereafter "Good Society.")
 23. "Good Society."
 24. I am grateful to Daniel Egnor for enunciating this as a general political principle, and to the people of Fenway House, a consensus–based living group of about 20 college students, for demonstrating with excruciating empirical clarity how completely necessary a practice it is to follow.
 25. "Good Society."
 26. The term itself originated in the late 1800s, and in the law profession, at least, became commonly used only in the late 1970s (corroborating Litman's timeline of the changing "theory" of copyright). See *Ideas*, chapter 6, footnote 26, pp. 293–4, which offers actual usage counts in case law, supplied by Prof. Hank Greely.
 27. Recording Industry Association of America. "What is Piracy?" <<http://www.riaa.org/Protect-Campaign-1.cfm>>; accessed 29 Jan. 2002.
 28. See note 1.
 29. "IIPA."
 30. "Good Society."
 31. *Ideas*.
 32. *Ideas*. Chapter 6, footnote 8, p. 291. The text was published in 1982 by Belknap Press of Harvard University.
 33. Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business School Press, 1997, 2000.
 34. Lessig, Lawrence. *Code and other laws of cyberspace*. Basic Books, 1999.
 35. "GNU's Not Unix!" <<http://www.gnu.org>>; accessed 10 Dec. 2001.
 36. Stallman, Richard M. "The GNU Manifesto." 1983, revised 1993. <<http://www.gnu.org/gnu/manifesto.html>>; accessed 30 Jan. 2002.
 37. Free Software is meant to be "free" in terms of liberty (to copy, modify, and use), not price. Open Source software is "officially" (see <<http://www.opensource.org/docs/definition.html>>; accessed 10 Dec. 2001) Free, and Free Software's source code is similarly Open. Two quasi–rival camps have begun using these terms, respectively emphasizing ethics vs. practical motivations. Informally, software with "open source" (i.e. source code that is publicly available) may be non–Free. Among other things, the Free Software camp tends to

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emphasize Copyleft more than Open Source advocates. See the following for discussion of the philosophical and other differences, which you may safely ignore for the purposes of this thesis:

- <<http://www.fsf.org/philosophy/free-software-for-freedom.html>>; accessed 10 Dec. 2001.
- <<http://www.opensource.org/advocacy/free-notfree.html>>; accessed 10 Dec. 2001.
- <<http://www.salon.com/21st/feature/1998/09/11feature2.html>>; accessed 10 Dec. 2001.
38. Free Software Foundation. “GNU General Public License.” Version 2, June 1991. <<http://www.gnu.org/copyleft/gpl.html>>; accessed 10 Dec. 2001.
39. Free Software Foundation. “Various Licenses and Comments About Them.” 29 Jan. 2002. <<http://www.gnu.org/philosophy/license-list.html>>; accessed 30 Jan. 2002.
40. *Ideas*.
41. On Eric Raymond being practical, see: <http://www.salon.com/21st/feature/1998/04/cov_14feature.html> and following (accessed 10 Dec. 2001). Raymond was quoted saying to Richard Stallman: “Either open source is a net win for both producers and consumers on pure self-interest grounds or it is not. If it is, you cannot lose; if it is not, you cannot (and should not) win. Either way, the moralizing you do about how things ‘ought’ to be is at best useless, and at worst actively harmful.”
42. Raymond, Eric. *The Cathedral and the Bazaar*. O’Reilly, 1999 and 2001 (out of print). Also available at <<http://www.tuxedo.org/~esr/writings/cathedral-bazaar/>>; accessed 10 Dec. 2001. This essay is famous for having helped convince Netscape to open-source its popular web browser.
43. “History of the OSI.” <<http://www.opensource.org/docs/history.html>>; accessed 31 Jan. 2002.
- Martin, Brian. *Information Liberation* (Freedom Press, London, 1998). See chapter 3, or <<http://www.uow.edu.au/arts/sts/bmartin/pubs/98il/il03.html>>; accessed 30 Jan. 2002.
- Riegle, Rodney P. “The Death and Rebirth of Plagiarism.” <<http://www.coe.ilstu.edu/rpriegle/wwwdocs/plagiari.htm>>; accessed 31 Jan. 2002.
- Samudrala, Ram. “A primer on the ethics of ‘intellectual property.’” <http://www.ram.org/ramblings/philosophy/fmp/copying_primer.html>; accessed 31 Jan. 2002.
44. See GNU Manifesto, note 36, where Stallman says:
- I consider that the golden rule requires that if I like a program I must share it with other people who like it. Software sellers want to divide the users and conquer them, making each user agree not to share with others. I refuse to break solidarity with other users in this way. I cannot in good conscience sign a nondisclosure agreement or a software license agreement....So that I can continue to use computers without dishonor, I have decided to put together a sufficient body of free software so that I will be able to get along without any software that is not free.*
- The Free Software Foundation also posted the following in “Regarding Gnutella” <<http://www.gnu.org/philosophy/gnutella.html>>; accessed 27 Oct. 2001 and since changed.
- The Free Software Foundation is concerned with the freedom to copy and change software; music is outside our scope. But there is a partial similarity in the ethical issues of copying software and copying recordings of music. Some articles in the philosophy directory relate to the issue of copying for things other than software. Some of the other people’s articles we have links to are also relevant.*
- No matter what sort of published information is being shared, we urge people to reject the assumption that some person or company has a natural right to prohibit sharing and dictate exactly how the public can use it. Even the US legal system nominally rejects that anti-social idea.*
45. Long, Roderick T. “The Libertarian Case Against Intellectual Property Rights.” <<http://www.freenation.org/a/f3111.html>>; accessed 28 Oct. 2001.
46. See Samudrala in note 44, which says (brackets as in original):
- The abridgement of the [freedom of] copying, use, distribution, and modification of published information (as defined in USC 17) is unethical for three main reasons, all taken in conjunction with each other:*
- * Arbitrary copying, use, distribution, and modification of published information generally does not cause harm to anyone....*

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** Abridgement of the [freedom of] copying, use, distribution, and modification of published information generally causes harm to the progress of the sciences and the arts....*

** Abridgement of the [freedom of] copying, use, distribution, and modification of published information also abridges your freedom of speech, expression, and your freedom to think freely....*

The [freedom of] copying, use, distribution, and modification of published information doesn't directly affect compensation and attribution because what is at question is the control of copying using top-down coercion, and the use of the subsequent copies. There is nothing that says authors and inventors shouldn't be compensated or shouldn't be attributed. The ownership model, currently in use, is not a necessary condition for compensation and attribution.

This reasoning applies to any bottom-up means of controlling the flow of information. From not publishing it, to keeping it a secret, to using technology to prevent copies from being made. It's only when the freedom of copying exists and governmental force is used to control information flow should we question whether it is right or wrong to do so (for everyone).

47. Stallman says:

The ethical issues about copying and modifying works depend on the kind of work and how people can use it. There is a certain basic similarity between all the kinds of works that can be in a file on a computer: you can always copy them, unless someone has gone out of his way to obstruct you. There are also differences. Novels, musical recordings, dictionaries, textbooks, scientific papers, essays, and software are not all used the same ways.

So I don't have the same views for all these different kinds of works. Textbooks and dictionaries should be free in the same strong sense as software: people should have the freedom to publish improved versions of them. For scientific papers, I think that everyone should be allowed to mirror them, but I see no reason to permit modified versions (that would be tampering with the historical record). For some kinds of works, such as novels, I am not sure just which kinds of freedom are essential.

However, a certain minimum freedom is essential for any kind of published work that is in a file on a computer: the freedom to occasionally make copies for other people. To deny people this basic freedom is intrusive and antisocial, and only Soviet-style methods can enforce the prohibition.

— <<http://slashdot.org/interviews/00/05/01/1052216.shtml>>; accessed 05 Dec. 2001.

48. Stallman, Richard M. "Science must 'push copyright aside'." <<http://www.nature.com/nature/debates/e-access/Articles/stallman.html>>; accessed 31 Jan. 2002.

Stallman, Richard M. "Freedom Or Copyright?" *Technology Review*, May/June 2000.

49. Stallman, Richard M. "The Free Universal Encyclopedia and Learning Resource." Linked from <<http://www.gnu.org/encyclopedia/>>; accessed 31 Jan. 2002.

50. Free Software Foundation. "GNU Free Documentation License." Version 1.1, March 2000. <<http://www.gnu.org/copyleft/fdl.html>>; accessed 31 Jan. 2002.

51. Berkman Center for Internet & Society. "Copyright's Commons." <<http://cyber.law.harvard.edu/cc/cc.html>>; accessed 31 Jan. 2002.

52. Samudrala, Ram. "The Free Music Philosophy." Version 1.4. <<http://www.ramorg/ramblings/philosophy/fmp.html>>; accessed 31 Jan. 2002.

53. Robertson, Colin Z. "Free Media Licenses." <<http://rtnl.org.uk/free-media-licenses/>>; accessed 2 Feb. 2002.

Open Music. "The Open Music License." <<http://openmusic.linuxtag.org/showitem.php?item=209>>; accessed 2 Feb. 2002.

Open Music Registry. <<http://www.openmusicregistry.org/>>; accessed 2 Feb. 2002.

GnuArt. <<http://gnuart.org/english/index.html>>; accessed 2 Feb. 2002.

54. Douglas, Susan J. *Inventing American broadcasting*. Johns Hopkins University Press, 1987. p. 25.

55. "Netdancer," a participant in the Free/Open Source GIMP project. "global street performers?" Comment posted on 3 Mar 2001, in response to comments by others on the article "Moneyflow" by the same author.

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- <<http://www.advogato.org/article/253.html>>; accessed 5 Feb. 2002.
56. Eric Raymond, a hero of the movement, concretely ties hackerdom with libertarianism:
4. *Freedom is good.*
- Hackers are naturally anti-authoritarian. Anyone who can give you orders can stop you from solving whatever problem you're being fascinated by — and, given the way authoritarian minds work, will generally find some appallingly stupid reason to do so. So the authoritarian attitude has to be fought wherever you find it, lest it smother you and other hackers.*
- (This isn't the same as fighting all authority. Children need to be guided and criminals restrained. A hacker may agree to accept some kinds of authority in order to get something he wants more than the time he spends following orders. But that's a limited, conscious bargain; the kind of personal surrender authoritarians want is not on offer.)*
- Authoritarians thrive on censorship and secrecy. And they distrust voluntary cooperation and information-sharing — they only like 'cooperation' that they control. So to behave like a hacker, you have to develop an instinctive hostility to censorship, secrecy, and the use of force or deception to compel responsible adults. And you have to be willing to act on that belief.*
- <<http://tuxedo.org/~esr/faqs/hacker-howto.html>>; accessed 31 Oct 2001.
57. The site's self-proclaimed motto is, "News for Nerds, Stuff That Matters." It is a very well known (perhaps the most popular) source for news in the Technolibertarian community (and perhaps the information technology industry in general), with a readership in at least the tens of thousands. <<http://slashdot.org>>; accessed 3 Feb. 2002.
58. Boyle, James. "Foucault In Cyberspace: Surveillance, Sovereignty, and Hard-Wired Censors." 1997. <<http://www.wcl.american.edu/pub/faculty/boyle/foucault.htm>>; accessed 31 Jan. 2002.
59. Boyle (see note 59, above) indirectly attributes this to John Gilmore, a founder of the Electronic Frontier Foundation (EFF), in his footnote 4:
- There are a variety of versions of the claim but the content is pretty consistent. See, e.g., John Perry Barlow, *Passing the Buck on Porn* (visited June 24, 1996) <http://www.eff.org/pub/Publications/John_Perry_Barlow/HTML/porn_and_responsibility.html> "The Internet, in the words of ... John Gilmore, 'deals with censorship as though it were a malfunction and routes around it.'" Judith Lewis, *Why Johnny Can't Surf*, *LA Weekly*, Feb. 21, 1997, at 43. "[I]t's not easy to push standards of decency on a network that, as ... John Gilmore put it (though even he can't remember where), treats censorship as damage and routes around it.*
60. Barlow, John Perry. "Leaving the Physical World." <http://www.eff.org/Publications/John_Perry_Barlow/HTML/leaving_the_physical_world.html>; accessed 31 Jan. 2002.
61. Brand, Stewart. *The Media Lab: Inventing the Future at M.I.T.* Viking Penguin, 1987. Brand wrote about information freedom in terms of both liberty and cost.
- "Information wants to be (politically) free" (section heading, p. 211.) Brand talks about freedom of speech in the section that follows, which is certainly a Libertarian cause, though he does not address Information Freedom with respect to intellectual property.
- "Information wants to be free because it has become so cheap to distribute, copy, and recombine — too cheap to meter. It wants to be expensive because it can be immeasurably valuable to the recipient." (p. 202)
- "Congress shall make no law . . . abridging the freedom of speech or of the press.
- Elegant code by witty programmers." (dedication)
- Similar sentiments are also generally attributed to Peter Samson of the Tech Model Railroad Club (at the Massachusetts Institute of Technology) in the late 1950s.
62. Raymond, Eric S. "Meatspace." *The Jargon File*. Version 4.3.1, 29 Jun. 2001. <<http://www.tuxedo.org/~esr/jargon/html/entry/meatspace.html>>; accessed 2 Feb. 2002.
63. The legal ignorance and disobedience of amateur radio operators in 1912 parallels that of many modern-day

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Technolibertarians. See:

- Douglas, Susan. *Inventing American broadcasting*. Johns Hopkins University Press, 1987, pp. 216–239.
64. Both are offered by HavenCo (see <http://www.havenco.com/>; accessed 31 Jan. 2002), which is located in the Principality of Sealand.
65. Cha, Ariana Eunjung. “Rise of Internet ‘Borders’ Prompts Fears for Web’s Future.” *The Washington Post*. Friday, January 4, 2002; Page E01. Also available at <http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&node=&contentId=A59227-2002Jan3>; accessed 2 Feb. 2002.
66. Thomas Jefferson, Letter to Isaac McPherson, August 13, 1813. Cited at both:
- Phillips, Timothy. “Thomas Jefferson’s copyright term.” 9 Feb. 1999, e-mail to mailing list cni-copyright@cni.org. Reprinted at [http://digital.library.upenn.edu/books/bplist/archive/1999-02-11\\$2.html](http://digital.library.upenn.edu/books/bplist/archive/1999-02-11$2.html); accessed 5 Feb. 2002.
- The Freenet Project. <http://freenet.sourceforge.net/index.php?page=quotes>; accessed 14 Oct 2001. Since taken offline; archived at <http://web.archive.org/web/20010820003519/http://freenet.sourceforge.net/index.php?page=quotes>; accessed 6 Feb. 2002.
67. Clarke, Ian. Post to the “Pho” electronic mailing list (maintainer: griffin@onehouse.com), 20 Jul. 2000. Cited by Freenet (see note 67).
- “I was in the pub last night, and a guy asked me for a light for his cigarette. I suddenly realised that there was a demand here and money to be made, and so I agreed to light his cigarette for 10 pence, but I didn’t actually give him a light, I sold him a license to burn his cigarette. My fire–license restricted him from giving the light to anybody else, after all, that fire was my property. He was drunk, and dismissing me as a loony, but accepted my fire (and by implication the licence which governed its use) anyway. Of course in a matter of minutes I noticed a friend of his asking him for a light and to my outrage he gave his cigarette to his friend and pirated my fire! I was furious, I started to make my way over to that side of the bar but to my added horror his friend then started to light other people’s cigarettes left, right, and centre! Before long that whole side of the bar was enjoying MY fire without paying me anything. Enraged I went from person to person grabbing their cigarettes from their hands, throwing them to the ground, and stamping on them.*
- Strangely the door staff exhibited no respect for my property rights as they threw me out the door.”*
68. Free Software Foundation “Philosophy of the Free Software Foundation.” 24 Jan. 2002. <http://www.gnu.org/philosophy/philosophy.html> Visited 6 Feb. 2002.
- “Free software is a matter of freedom: people should be free to use software in all the ways that are socially useful. Software differs from material objects—such as chairs, sandwiches, and gasoline—in that it can be copied and changed much more easily. These possibilities make software as useful as it is; we believe software users should be able to make use of them.”*
69. “dpilot,” a Slashdot user. “You’ve hit the tip of the iceberg...” Comment (rated 5 out of 5) posted on 27 July 2001 in response to the story “Renewed Crackdown On File Sharing,” posted by “timothy” on the same day. <http://slashdot.org/article.pl?sid=01/07/27/0451214&mode=thread>; accessed 5 Feb. 2002.
- “The publishing industry, be it text, music, or whatever, used to be in the business of making information available to the market.*
- That has changed, because the Internet is far more efficient at that.*
- The publishing industry is now in the business of manufacturing scarcity, controlling access to that information. This is a fundamental paradigm change. Their present business model depends on their controlling access to ‘their’ information, and no business likes to change business models.”*
70. Samudrala, Ram. “A primer on the ethics of ‘intellectual property.’” http://www.ram.org/ramblings/philosophy/fmp/copying_primer.html; accessed 31 Jan. 2002.
- “Simply put, intellectual property laws attempt to make a scarce resource out of something that can be infinitely abundant. Why do this, when the reason for most conflict in the world lies with scarce resources?”*
- See also “dpilot” in note 70, above.

Endnotes

71. *Ideas*, chapter 3.
72. In fact, the need for a relatively long period of technological “gestation” can be a general phenomenon, not limited to telecommunications. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (MIT Press, 1987. Bijker, Hughes, and Pinch, ed.) contains two papers which shed some light on the details of this kind of innovation.

In “The Social Construction of Bakelite: Toward a Theory of Invention” (see pp. 174–185), Wiebe Bijker briefly explores the development of Bakelite, a kind of plastic. He shows how different applications were being considered at the time the manufacturing process was patented (1907) and when widespread adoption was occurring (circa 1930). Bijker also identifies social, technical, and economic difficulties in achieving widespread adoption of this technology.

In “The Evolution of Large Technological Systems” (see pp. 56–80), Thomas Hughes articulates a general theory which divides the process of techno–social change into five overlapping phases: invention; development; innovation; technology transfer; and growth, competition, and consolidation. With a wide variety of examples, including economic and legal factors, Hughes’ account helps explain why change can take a long time.
73. White, Thomas H. “Articles and Extracts I: 1897–1917.” *United States Early Radio History*. <<http://www.ipass.net/~whitetho/part1.htm>>; accessed 6 Feb. 2002.
74. Barnouw, Erik. *Tube of Plenty*. Oxford University Press, 1995. (Hereafter *Tube*.) p. 9.
75. Douglas, Susan J. *Inventing American Broadcasting, 1899–1922*. Johns Hopkins University Press, 1987. (Hereafter *Inventing Broadcasting*.) pp. 62–64.

Also see White (note 74) and the following section, “Articles and Extracts II: 1917–1927” <<http://www.ipass.net/~whitetho/part2.htm>>; accessed 6 Feb. 2002.
76. *Tube*, pp. 15–16.
Inventing Broadcasting, pp. 61–103 and 318
77. *Inventing Broadcasting*, pp. 292–304.
78. *Tube*, pp 43–44.
79. Randle, Quint. “A Historical Overview of the Effects of New Mass Media Introductions on Magazine Publishing During the 20th Century” *First Monday: Peer-Reviewed Journal on the Internet*. September, 2001 issue. <http://www.firstmonday.org/issues/issue6_9/randle/index.html>; accessed 6 Feb. 2002.
80. Genova, Tom. “Television History — The First 75 Years.” 9 April 2001. <<http://www.tvhistory.tv/>> and following; accessed 6 Feb. 2002.
81. *Tube*, p. 89.
82. See Genova, note 81.
83. *Ibid*, “Timeline [1950–1959]” <<http://www.tvhistory.tv/timeline3.htm>>; accessed 6 Feb. 2002.
84. *Tube*, pp. 54–116.

For a good timeline showing detailed channel availability in New York City and other locations, see: Miller, Jeff. “A U.S. Television Chronology, 1875–1970.” <<http://members.aol.com/jeff560/chronotv.html>>; accessed 6 Feb. 2002.
85. “Television.” *The Columbia Encyclopedia*, Sixth Edition, 2001. Available at <<http://www.bartleby.com/65/te/televi.html>>; accessed 6 Feb. 2002.
86. For thoughts on the increasing “speed” of information and society in general, see:

Gleick, James. *Faster: The Acceleration of Just About Everything*. Pantheon Books, 1999.
87. Zakon, Robert H. “Hobbes’ Internet Timeline.” Version 5.5, 3 Jan. 2002. <<http://www.zakon.org/robert/internet/timeline/>>; accessed 6 Feb. 2002. (Throughout this paragraph, hereafter “Internet Timeline.”)
88. Griffin, Scott. “Doug Englebart.” <<http://www.ibiblio.org/pioneers/englebart.html>>; accessed 7 Feb. 2002.

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89. "Internet Timeline."
90. MetaFacts, Inc. "U.S. Internet Penetration — Growing by Leaps and Bounds." 1 Jun. 1999. <<http://www.metafactsusa.com/pubs/tupdates/tupdate990601.htm>>; accessed 6 Feb. 2002.
91. Pastore, Michael. "Spending Carefully or All Teched Out?" 31 Oct. 2001. <http://cyberatlas.internet.com/big_picture/hardware/article/0,,5921_914411,00.html>; accessed 6 Feb. 2002.
92. National Telecommunications and Information Administration, Economics and Statistics Administration, U.S. Department of Commerce. "Reasons for U.S. Households with a Computer/WebTV Never Accessing the Internet, Percent Distribution, 2000." Figure I-17 in *Falling Through the Net: Toward Digital Inclusion. A Report on Americans' Access to Technology Tools*. October 2000. <<http://www.ntia.doc.gov/ntiahome/digitaldivide/index.html>>, specifically <<http://www.ntia.doc.gov/ntiahome/fttn00/chartI-17.htm>>. Both accessed 6 Feb. 2002.
93. Campbell-Kelly, Martin and Aspray, William. *Computer: A History of the Information Machine*. Basic Books, 1996. pp. 228-297
94. For example, SourceForge (<http://sourceforge.net/>; accessed 6 Feb. 2002) is a site which provides mailing lists, online storage, and other facilities for Free/Open Source development projects.
95. LISTSERV e-mail distribution technology is popular for academic collaborations. For a global index of registered lists, see "CataList" at <<http://www.lsoft.com/lists/listref.html>>. As of 6 Feb. 2002, there are 53,245 public lists registered, and 153,482 private ones. 29,890 lists were hosted at educational institutions (by domain name.)
96. A vast archive of the Internet-wide Usenet newsgroups is available from Google at <<http://www.google.com/grphp?hl=en>>; accessed 6 Feb. 2002.
97. I calculated this by taking the uses reported at <<http://www.infoplease.com/ipa/A0880512.html>> ("Online Activities by Age," citing as a source :Jupiter Media Metrix, Jupiter Consumer Survey, July 2000) and re-constructing the overall usage figure for Instant Messaging by applying a weighted average based on population data. That was obtained by interpolating the demographic data from Table II-2 in the NTIA report in note 93 ("Internet Use By Individuals Age 3-8 Years, 1998 and 2000" <<http://www.ntia.doc.gov/ntiahome/fttn00/charts00.html#t51>>) into the proper age ranges. I got 50.4% for IM and 38.0% for "chat"; these pages unfortunately did not explain the difference between the two, but I suspect the latter may represent group chat, as opposed to person-to-person instant messaging.
98. Karr, Rick. "Internet Radio." All Things Considered, National Public Radio, 30 Aug. 2001. (Audio recording, RealAudio format.) Available at <<http://search.npr.org/cf/cmn/cmnpd01fm.cfm?PrgDate=08%2F30%2F2001&PrgID=2>>; accessed 6 Feb. 2002.
U.S. Copyright Office. "Rulemakings and Related Actions Concerning Webcasting." 15 Dec. 2000. <<http://www.loc.gov/copyright/carp/webcast.html>>; accessed 6 Feb. 2002.
17 USC Sec. 114.
Brown, Janelle. "Music Industry to Webcasters: Pay Up!" *Salon*, 9 Nov. 1998. <<http://www.salon.com/21st/feature/1998/11/09feature2.html>>; accessed 6 Feb. 2002.
Shahinian, Mark L. "Why college radio fears the DMCA." *Salon*, 13 Dec. 2001. <http://www.salon.com/tech/feature/2001/12/13/college_webcast/>; accessed 6 Feb. 2002.
99. *Digital Copyright*. pp. 29 and 181.
100. "Copyright Timeline." <<http://arl.cni.org/info/frn/copy/timeline.html>>; accessed 26 Dec. 2000.
101. Public Law 94-553.
102. 17 USC Sec. 107.
103. Nolo. "When Copying Is OK." <<http://www.nolo.com/lawcenter/ency/article.cfm/objectID/C3E49F67-1AA3-4293-9312F5EC119B5806/catID/2EB060FE-5A4B-4D81-883B0E540CC4CB1E>>; accessed 4 Feb. 2002.
104. 17 USC Secs. 110(1) and 110(2)

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105. 17 USC Sec. 108.
106. 17 USC Sec. 121.
107. 17 USC Sec. 101.
108. Brabec, Thomas and Brabec, Jeff. "Music and Money: Where The Money Comes From For Writers and Publishers." <<http://www.ascap.com/musicbiz/music4money.html>>; accessed 1 Jan. 2002.
109. 17 USC Sec. 101.
110. 17 USC Sec. 106.
111. 17 USC Sec. 101.
112. 17 USC Sec. 109.
113. 17 USC Sec. 106.
114. Harry Fox Agency. "Live Stage Licensing." <<http://www.nmpa.org/hfa/perform.html>>; accessed 4 Feb. 2002.
115. Harry Fox Agency. "Harry Fox Agency, Inc." <<http://www.nmpa.org/hfa.html>>; accessed 1 Jan. 2002.
116. 17 USC Sec. 101.
117. 17 USC Sec. 110(3).
118. 17 USC Sec. 110(4).
119. 17 USC Sec. 110(10).
120. 17 USC Sec. 110(7).
121. 17 USC Sec. 115.
122. 17 USC Sec. 115(c).
123. 17 USC Sec. 115(b).
124. 17 USC Sec. 115(c)(1).
125. 17 USC Sec. 115 (c)(3)(B).
126. Gayton, Cynthia M. "MUSIC LICENSING: LEGAL DEVELOPMENTS FOR THE INDEPENDENT LABEL." <<http://www.outersound.com/osu/publishing/net-licensing.html>>; accessed 1 Jan. 2001.
127. Harry Fox Agency. "Current Statutory Royalty Rate." <<http://www.nmpa.org/hfa/ratecurrent.html>>; accessed 4 Feb. 2002.
128. "SongFile Home." <<http://www.songfile.com/>>; accessed 4 Feb. 2002.
129. Federal Trade Commission. "Record Companies Settle FTC Charges of Restraining Competition in CD Music Market" 10 Mar. 2000. <<http://www.ftc.gov/opa/2000/05/cdpres.htm>>; accessed 1 Jan. 2002.
130. Recording Industry Association of America. "Membership List." <<http://www.riaa.com/About-Members-1.cfm>>; accessed 4 Feb. 2002.
131. See, for example, the ownership site maintained by Aaron Moore and the Columbia Journalism review (accessed 4 Feb. 2002), in particular: <<http://www.cjr.org/owners/aoltimewarner.asp>>, <<http://www.cjr.org/owners/bertelsmann.asp>>, <<http://www.cjr.org/owners/vivendi.asp>>, and <<http://www.cjr.org/owners/sony.asp>>
132. 17 USC Sec. 109(b)(1)(A).
133. 17 USC Sec. 109(a).
134. 17 USC Sec. 116.
135. 17 USC Sec. 1101.
136. *Digital Copyright*.
137. A careful reading of 17 USC Sec. 106 reveals this lack of protection. I am grateful to "The Regulation of Streaming Audio Sites" (Fall 1998, <<http://www.shazmo.com/library/music-contents.html>>; accessed 6 Jan. 2002) for alerting me to this rather confusing point, as well as the law change in 1995. This piece also goes into more depth about digital transmission rights, but is perhaps slightly out of date.

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138. 17 USC Sec. 118.
139. Public Law 104–39.
140. 17 USC Sec. 114(d)(1)(A).
141. 17 USC Sec. 114(d)(1)(B).
142. It also preserves this freedom for record and music store owners. See 17 USC Sec. 114(d)(1)(C)(ii).
143. 17 USC Sec. 114(f).
144. 17 USC Sec. 114(d)(2).
145. 17 USC Sec. 114(g).
146. 17 USC Secs. 114(d)(3) and 114(e).
147. 17 USC Sec. 115 (c)(3)(A).
148. 17 USC Sec. 112.
149. 17 USC Sec. 111(a)(1).
150. 17 USC Sec. 110(5)(B).
151. 17 USC Sec. 111(a)(2).
152. 17 USC Secs. 111(a)(4) and 119
153. 17 USC Secs. 111(a)(3), 111(a)(5), and 110(5)(A).
154. American Society of Composers, Authors, and Publishers. “The ASCAP Surveys.” <<http://www.ascap.com/about/payment/surveys.html>>; accessed 4 Feb. 2002.
155. Public Law 102–563 (10/28/92), now 17 USC Sec. 10.
156. 17 USC Sec. 1008.
157. 17 USC Sec. 4(B)(ii).
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162. Woestenbergh, Leon. “Defeating SCMS (Serial Copy Management System).” <<http://www.esrac.ele.tue.nl/~leon/scms/>>; accessed 26 Dec. 2001.
163. 17 USC Sec. 1002(c).
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166. American Society of Composers, Artists, and Publishers. “The ASCAP Payment System: Turning Performances Into Dollars.” <<http://www.ascap.com/about/payment/dollars.html>>; 06 Jan. 2002, and following.
167. Burns (see note 173) provides evidence both that this is a common belief in the industry, and that the effect is real. Also see another paper by Burns: “The creation and following of public opinion: A history of music choice in radio programming.” Paper presented at the Central States Communication Association annual convention, St. Paul, MN. April, 1996. Available at <<http://www.joeburnsphd.com/musicchoice.html>>; accessed 6 Jan. 2002.
168. This dramatic trend is well documented at: <<http://www.cleveradio.com/About/about.htm>>; accessed 6 Jan. 2002.

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169. See the Burns papers in notes 168 and 173.
170. An excellent expose on this disturbing practice is at <http://www.salon.com/ent/clear_channel>; accessed 6 Jan. 2002.
171. Kot, Greg. "WHAT'S WRONG WITH RADIO: With corporate ownership and a new form of payola strangling playlists, listeners are tuning out." *Rolling Stone*, 16 Aug. 2001. Available at <<http://www.npgmusicclub.com/npgmc/freedom/newz/wrongwithradio.html>>; accessed 6 Jan. 2002.
172. Burns, Joseph E. "The first move: A content analysis of national radio airplay and sales charts." Paper presented at Central States Communication Association annual convention, St. Louis, MO. April 1997. Available at <<http://www.joeburnsphd.com/airsale.html>>; accessed 6 Jan. 2002.
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175. Napster. <<http://www.napster.com/>>; accessed 4 Feb. 2002.
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178. See "Napster News," note 177.
179. America Online. "Who We Are." <http://corp.aol.com/press/press_datapoints.html>; accessed 2 Mar. 2001.
180. Despain, Jeremy. <<http://www.oneoffinc.com/info/historycd.cfm>>; accessed 7 Jan. 2001. Cites Pholmann, Ken C. *The Compact Disc Handbook, 2nd Edition*. A-R Editions, 1992.
Waters, Sheri. "Compact Disc 101." <<http://teenmusic.about.com/library/weekly/aa012401a.htm>>; accessed 7 Jan. 2001.
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Thomson Multimedia. "Patent Portfolio." 2001. <<http://www.mp3licensing.com/patents/index.html>>; accessed 7 Jan. 2002.
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186. *Leiber, et al. v. Napster, Inc.*, (N.D. Cal. 2000). Documents available online at <<http://findlaw.com/napster/>>; accessed 8 Feb. 2002.
187. By that time, two additional lawsuits (*Metallica v. Napster* and *Casanova Records v. Napster*) had been brought, so four separate injunctions were entered. See <<http://findlaw.com/napster/>>, e.g. <<http://news.findlaw.com/cnn/docs/napster/napster030601ord.pdf>>
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All accessed 8 Jan. 2002.

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191. *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984)
192. *Recording Industry Association of America v. Diamond Multimedia Sys., Inc.*, 180 F.3d 1072 (9th Cir. No. 98–56727 1999)
193. For a good summary of *Diamond*, and online access to the full text, see <<http://eon.law.harvard.edu/h2o/property/MP3/rio.html>>; accessed 8 Feb. 2002. See also *Napster* opinion in note 191.
194. *UMG Recordings, et al. v. MP3.com Inc.* (SD NY 2000) 00 Civ. 472 (JSR). 4 May 2000 opinion. Available from <http://www.riaa.org/PDF/MP3_Court_Ruling.pdf>; accessed 8 Feb. 2002.
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PR Newswire. “Matador Records Licenses Full Catalog to Napster” 6 Dec. 2001. <<http://investor.cnet.com/investor/news/newsitem/0–9900–1028–8085334–0.html>>; accessed 8 Feb. 2002.
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203. PressPlay. “frequently asked questions.” <<http://www.pressplay.com/faq.html>>; accessed 14 Jan. 2002.
204. See Ahrens, note 200.
205. Columbia Journalism Review. “Who Owns What.” <<http://www.cjr.org/owners/vivendi.asp>>; accessed 8 Feb. 2002.
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“Napster is just reflecting what people have been complaining about for a long, long time — The cheesy mass–produced music that we just love is too damn expensive. Very few CDs are worth the obligatory \$15, IMHO.

Endnotes

- If the record industry wasn't such a **bloated** near-monopoly very few people would bother to copy and distribute copyrighted music....the music industry doesn't care about selling a quality product at a competitive price, it only cares about hyping the next sensation and making teenagers spend mom's last Jackson on some CD that'll be in the discount bin in 18 months.*" [sic, except for bolding and ellipses]
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364. “Lawrence Lessig Answers Your Questions.” Posted by “timothy” on 21 Dec. 2001. <<http://slashdot.org/interviews/01/12/21/155221.shtml>>; accessed 22 Jan. 2002.