

# **Advanced Peer-Based Technology Business Models**

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A new economic framework for the digital distribution of  
music, film, and other intellectual property works

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## Abstract

The mass adoption of the Internet and the creation of digital standards for the storage of information goods (e.g. written documents, audio recordings, videos) has allowed individuals to exchange these goods with one another on an international scale with essentially no marginal cost. This phenomenon has been accelerated by the rise of peer-to-peer (P2P) file sharing systems, which provide a public marketplace for the express purpose of finding and exchanging these goods. Napster was the first such system, and is still the most famous, but its demise has been followed by the ascendance of more powerful systems such as KaZaA, Gnutella, and Freenet – which now boast more aggregate users than Napster ever had.

This thesis examines the social behaviors, economic ramifications, legal issues, and technological developments which are the results of this ultimate form of disintermediation. It concludes by proposing a strategy for the effective commercial distribution of information goods in a world of free exchanges. The recording industry is examined most closely, since this is the industry with the most copyrighted content available on these systems. Primary data has been collected from 23 interviews with industry representatives, technologists and end users plus 206 questionnaires from end users alone. An additional 1141 questionnaires were administered anonymously via the Internet for comparison. The results indicate that a viable business model requires several responses to current trends. The qualitative model proposed in this thesis consists of three strategic complementarities:

1. A new pricing model.
2. A commercial file sharing standard.
3. A strategy for minimizing the negative impact of free exchanges.

The suggested format for each of these actions is examined. It is argued that all three responses are crucial for the online success of any information goods industry, and that an incomplete solution will be rejected by consumers.

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# Introduction

The purpose of this thesis is to develop a qualitative understanding of the impact of peer-based free exchanges on the social and economic value of information goods, and use that to develop a sustainable online business model for information goods industries. There are a number of studies that have been conducted on MP3 usage, peer-based systems, Internet usage and other related topics, and the most relevant statistics are presented here to provide a context for the specific issues examined. In addition, primary data has been collected through 23 interviews with executives, technologists and end users, 206 questionnaires from end users, and 1141 Internet questionnaires.

The paper consists of 5 main chapters and two appendices. The first chapter introduces a definition for the concept of information goods, and briefly surveys the relevant legislation and case law which is relevant to their protection under copyright. Understanding the requirements and limits of the law is crucial to the development of a viable business strategy in any area – but it's one of the principle considerations for information goods industries. The second chapter examines consumer behavior, and describes the modalities related to the sharing of information goods that myself and others have observed in the last 15 years in various segments of the population. The third chapter describes the recording industry, which is studied in depth. Its history, value chain, key players and statistics are presented and analyzed. The fourth chapter presents the primary data collected through the administered survey, and analyzes its meaning and implications with the benefit of the opinions collected through direct interviews. The questionnaire itself, as well as a group of representative anecdotal feedback, is presented in Appendix A. The fifth chapter proposes a new online business model for information goods industries, using the music industry as the primary example. It consists of a sequence of prescribed measures, and analysis is presented to argue why such a model, and only such a model, will be successful in the short run and sustainable in the long run.

It should be noted that this paper is not trying to produce a comprehensive solution for the problems facing the recording industry. It is possible (and in my opinion quite probable) that the vociferous protection of copyrighted material, at least as a primary goal, may not be the best way for recording labels to maximize their revenues. The dynamics of the recording industry are studied in order to illustrate certain economic and managerial arguments pertaining to information goods industries online. However, issues that are not directly related to the creation and usage of information goods cannot necessarily be related to other industries, and are therefore not dealt with. Instead, this paper tries to focus on how any industry can maximize revenues from commercial information goods in the face of free information exchanges which give those goods to consumers without cost.

# Chapter 1

## Information Goods

This section deals with the nature of information goods, the legal definitions used, and the history of relevant legislation and case law. The laws in this area, although they can't maintain up-to-date parity with the latest technology, change just as frequently and are thus an extremely exciting area of study in their own right.

### 1.1 Definitions

While there are many ways to formally define what constitutes an information good, we will use a commonly accepted definition (Schapiro and Varian, 1999, p. 3) which simply includes anything that can be digitized – that is, encoded into a stream of bits. The works covered by this definition correspond with the US Copyright Office's list of works which can be protected by copyright<sup>1</sup>:

- Literary works (includes computer software)
- Musical works, including any accompanying words
- Dramatic works, including any accompanying music
- Pantomimes and choreographic works
- Pictorial, graphic and sculptural works
- Motion pictures and other audiovisual works
- Sound Recordings
- Architectural Works

While literary works and sound recordings provide the most readily available examples of digitizable goods, it should be noted that all of these types of works can be recorded digitally in some fashion – and thus transmitted through computer networks and replicated without loss of quality.

It has been argued that the small-scale exchange of information goods – in digital form or otherwise – may actually increase seller profits when the efficiency of sharing exceeds the efficiency of replication by the seller (Bakos, Brynjolfsson and Lichtman, 1999). Such sharing has been a tacitly accepted practice by government regulators and sellers alike. However, the

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<sup>1</sup> <http://www.copyright.gov/circs/circ1.html>

advent of recent technologies, which permit sharing on a worldwide scale, pose significant legal, social and economic concerns.

## 1.2 Copyright Law

Copyright law is the subset of intellectual property law which deals with “original expressive works”. Under US copyright law, the owner of an information good possesses the sole legal right to reproduce, adapt, distribute to the public, publicly perform, rent for commercial advantage, or import<sup>2</sup> that work for commercial use. While it is usually the owner’s responsibility to demonstrate and defend that copyright, the state can also bring criminal charges against willful violators of copyright law, in both the felony and misdemeanor categories<sup>3</sup>. The basic rules for copyright are:

Date of Work	Protected?	Term
Created 1-1-78 or after	When work is fixed in tangible medium of expression	Life + 70 years <sup>4</sup> (or if work of corporate authorship, the shorter of 95 years from publication, or 120 years from creation <sup>5</sup> )
Published before 1923	In public domain	None
Published from 1923 - 63	When published with notice	28 years + could be renewed for 47 years, now extended by 20 years for a total renewal of 67 years. If not so renewed, now in public domain
Published from 1964 - 77	When published with notice	28 years for first term; now automatic extension of 67 years for second term
Created before 1-1-78 but not published	1-1-78, the effective date of the 1976 Act which eliminated common law copyright	Life + 70 years or 12-31-2002, whichever is greater

<sup>2</sup> US Copyright Act, Section 501(a).

<sup>3</sup> <http://www.cybercrime.gov/ipmanual/03ipma.htm>

<sup>4</sup> Term of joint works is measured by life of the longest-lived author.

<sup>5</sup> Works for hire, anonymous and pseudonymous works also have this term. 17 U.S.C. § 302(c).



Created before 1-1-78 but published between then and 12-31-2002	1-1-78, the effective date of the 1976 Act which eliminated common law copyright	Life + 70 years or 12-31-2047 whichever is greater
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Table 1: Source: Gassoway, L., University of North Carolina.

Instead of providing a detailed chronology of copyright law<sup>6</sup>, only some of the most significant aspects of it will be covered here. The legal concept of Intellectual Property (IP) has only existed since 1709, after the British Parliament approved the Statute of Queen Anne to prevent a monopoly on the part of booksellers. During almost all of this time, the enforcement of the law was aided by the fact that physical reproduction was time consuming and expensive, making groups which engaged in piracy on a large scale easy to trace and punish.

Computer software programs were the first examples of copyright protected works stored easily (and in their case, exclusively) in digital media. But even software was transferred primarily on physical diskettes, and thus large piracy operations could be discovered and prosecuted by organizations such as the SIIA (Software & Information Industry Association). This changed with the advent of low-cost consumer modems. Suddenly, users could connect directly to one another's computers via telephone lines. They set up pirate bulletin board systems (BBS's) – known as “warez” (from *software*) sites – which allowed them to trade business software and computer games. When pirate BBS's were replaced by pirate FTP sites (see chapter 2), and then those FTP sites were supplanted by peer-to-peer (P2P) file sharing systems, willful copyright infringement ceased existing exclusively to be the esoteric domain of computer hackers and entered into the mainstream culture. Moreover, while modems in the 1970's and 1980's were fast enough to transfer only software and image files, the Internet provided transfer speeds sufficient to exchange music and even motion pictures.

There is now an extensive body of case law which deals with copyright issues in the digital realm, which can be referenced through the Department of Justice. There are also several relatively recent pieces of legislation which are relevant to digital copyright issues. They include:

*Digital Millennium Copyright Act (1998)*<sup>7</sup>. One of the most controversial pieces of copyright legislation ever passed in the United States, the DMCA was created ostensibly to bring US law in line with the World Intellectual Property Organization (WIPO) treaty on digital copyright protections. However, it has been attacked<sup>8</sup> for containing vague language and draconian limitations which critics believe curtail free speech and threaten computer security. The most controversial aspect of it is language which makes it a crime to “circumvent copyright protection systems”. Many experts believe this not only prevents unscrupulous individuals from reverse-engineering copy protection schemes for commercial gain, but that it also prevents anyone from

<sup>6</sup> <http://www.arl.org/info/frn/copy/timeline.html>

<sup>7</sup> <http://www.loc.gov/copyright/legislation/dmca.pdf>

<sup>8</sup> <http://anti-dmca.org>

legitimately researching and publishing the security flaws in a given system in order to protect public security interests.

*Online Copyright Infringement Liability Limitation Act (1998)*. This act is a subset of the DMCA, and it limits the liability of online service providers, most notably in four specific scenarios: Transmission, Caching, Storage (by users), and Linking. In other words, ISPs are exempt from liability for copyright infringement if infringing works – supplied by users – are handled by them only in one of these contexts.

*No Electronic Theft (NET) Act (1997)*<sup>9</sup>. This legislation outlaws the infringement of copyrights even when no monetary profit or commercial gain is present on the side of the infringing party. It closes what was referred to as the “LaMacchia Loophole” and now allows law enforcement agencies to pursue those who facilitate piracy on a commercial scale but without monetary gain.

*Audio Home Recording Act (1992)*<sup>10</sup>. This law specifically allows consumers to make digital copies of audio recording for personal use (“fair use”) only. There are several limitations which must be built into compliant devices (such as the inability to make copies of copies), and the act also states that manufacturers of digital recording devices and media must pay royalties (2% for devices, 3% for media) to the Sound Recording Fund and the Musical Works fund. These funds redistribute the money to the music industry.

Currently being considered: *Consumer Broadband and Digital Television Promotion Act (CBDTPA)*<sup>11</sup>. Introduced by Senator Fritz Hollings, the chairman of the Senate Commerce Committee, this bill would require that all “hardware or software” sold in the United States contain built-in copy-protection mechanisms. In other words, only digitally protected content, registered to the proper user, could be retrieved on a computer system, played on an MP3<sup>12</sup> player, or otherwise used in any consumer electronics device. Legal experts have stated that the language in the legislation would require copy-protection schemes to be built into nearly every piece of computer code utilized in any system.<sup>13</sup> The entertainment industry, including the RIAA (Recording Industry Association of America), has actually had a mixed reaction to the bill, after recognizing some of its inherent problems.

Each of these laws tends to make the Internet function a little more like the real world – at least in terms of regulation. There are many free speech advocates that equate regulation with the stifling of innovation and curtailing of freedom, and oppose all laws which circumscribe Internet

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<sup>9</sup> <http://www.cybercrime.gov/netsum.htm>

<sup>10</sup> [http://www.hrc.org/html/ahra\\_summary.html](http://www.hrc.org/html/ahra_summary.html)

<sup>11</sup> <http://www.wired.com/news/politics/0,1283,51275,00.html>

<sup>12</sup> MP3 stands for MPEG-3, or Moving Pictures Experts Group, Audio Layer III – the most successful audio compression technology, which allows audio to be compressed to one-tenth its original digital size with little to no discernable loss in quality. Although similarly efficient audio encoding technologies existed in the early 1990s, MP3 became the standard when its patent holder, the Fraunhofer Institute in Erlangen, Germany, put its use in the public domain.

<sup>13</sup> <http://www.wired.com/news/politics/0,1283,51274,00.html>

usage in any way. One of the leading authorities in this field – Lawrence Lessig, of Stanford University’s Law School – believes that regulation, at least in certain forms, will foster innovation on the Internet<sup>14</sup>.

*Ruling Against Napster*<sup>15</sup>. In March 2001, the US ninth circuit court of appeals enjoined Napster from facilitating the transfer of copyrighted works owned by several records companies which had filed suit against them. Users started renaming files and performing other masking tricks to continue to trade these songs, and the court revisited the issue and declared Napster’s effort to police its system a disgrace. Napster was then ordered to shut down their service completely until they could develop a new system which prevented the unlicensed sharing of copyrighted goods. While Napster researched legal and technological means to create such a system, users left for other services – such as Morpheus – and Napster now appears to be headed for bankruptcy.

*Court Cases vs. KaZaA*. Lawsuits were brought in early 2002 against KaZaA, MusicCity, and Grokster – all members of the FastTrack P2P network – in both US and Dutch courts. KaZaA’s immediate solution to its legal predicament was to sell its technology to a company called Sharman Networks – which had a location in Australia but was legally incorporated in the Pacific Island of Vanuatu. While the US litigation is still pending, a lower Dutch court quickly ruled against KaZaA, but that ruling was overturned in the appeals court. While the case can still be appealed to a higher court, the recent ruling found that KaZaA’s software was not illegal in and of itself, and it could not be held accountable for the illegal actions of its users. The logic behind this ruling was very similar to the landmark Betamax case which found Sony to not be liable for illegal recordings made by VCR owners. Thus, as of this writing, the legal system has not been able to touch KaZaA, and they are claiming 2.3 million<sup>16</sup> downloads per week. However it should be noted that any foreign company that offers services to US citizens can be sued in US courts. But how a hypothetical ruling against a foreign internet company would be enforced remains to be seen.

*Online Copyright Ruling Against Big Five Record Labels*. In the fall of 2001, the judge presiding over the Napster trial, US District Court Judge Marilyn Patel, ruled that the Big Five record labels must prove that they, and not songwriters, held the digital copyrights for their libraries of music. She also ruled that they must demonstrate that they did not collude to inhibit competitors from distributing online music. This ruling came from Napster continuing to press their defense that the Big 5 had misused their copyrights. Misuse of copyright can result in copyright owners not being allowed to enforce their copyrights at all.

*MP3.com ruling*. In 2000, MP3.com was sued by the Big 5 recording labels for its “My.Mp3.com” service, which allowed users to store their own MP3 files online and retrieve them from any computer. The court ruling initially required MP3.com to pay \$25,000 per infringement, to a maximum of \$250 million. The ruling found that the database of 80,000

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<sup>14</sup> <http://www.prospect.org/print/V11/10/lessig-1.html>

<sup>15</sup> <http://www.riaa.com/pdf/napsterdecision.pdf>

<sup>16</sup> <http://www.zdnet.com.au/newstech/ebusiness/story/0,2000024981,20264796,00.htm>

albums that MP3.com had created which – in conjunction with their software – allowed users to store music digitally and retrieve it from any computer, infringed on thousands of copyrighted tracks. MP3.com countersued, alleging unfair business practices from the labels, but they ended up settling with the majority of labels for \$20m in damages plus fees. Universal, however, pressed the lawsuit further. MP3.com ended up settling for \$53.4 million with them, including an agreement from Universal to allow the use of its catalog for the service.

*IIS settlement.* In April, 2002, Integrated Information Systems agreed to pay the RIAA \$1 million for storing thousands of MP3 files on their internal servers and giving access to all employees. While this did not set a legal precedent (many firms would simply settle to avoid legal hassles and costs, regardless of what their legal rights were) it did have the appearance of an admission of culpability. This will likely encourage the RIAA to pursue more such lawsuits while inhibiting corporations from engaging in such behavior.

## **The Future**

There are many issues pertaining to online copyright law which are unclear at this point. One of the most important is the efficacy of United States – or even WIPO – legislation on international copyright offenders. As more piracy operations base themselves in legal safe havens around the world, the ability to effectively police the Internet will be tested. If individual countries are not diligent about protecting intellectual property online, it is unclear what the owners of that IP – or their governments – can do about it. For example, what percentage of ISP's in China would have to ignore requests to police copyright infringing application use – if such policing is even possible – before China itself was “cut off” from the Internet by the international community? Is such a thing even possible? Is it ethical? Of course, the definition of exactly what kind of online activity is legal or illegal is still a grey area. According to Jupiter Research analyst Aram Sinnreich: “Most activities involving online music are not yet legal or illegal.”<sup>17</sup> In addition, as new technologies are developed, new case law is constantly being written through the courts. Thus, it is difficult to predict what new laws may be enacted in the coming years.

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<sup>17</sup> InformationWeek, April 10th. “Tech Firm Pays \$1M Penalty in MP3 Sharing Case”  
[http://story.news.yahoo.com/news?tmpl=story&ncid=74&e=7&cid=74&u=/cmp/20020410/tc\\_cmp/iwk20020410s0002](http://story.news.yahoo.com/news?tmpl=story&ncid=74&e=7&cid=74&u=/cmp/20020410/tc_cmp/iwk20020410s0002)

# Chapter 2

## Technology and Consumer Behavior

This section describes some of the patterns of consumer behavior related to the sharing of information goods in the last 20 years. It focuses on consumers' beliefs, incentives, and general motivations, as well as attitudes toward different categories of information goods.

### 2.1 Third Party Sharing

Most people are accustomed to sharing information goods through replication. They have made copies of tapes for themselves and others, taped television shows for friends, and probably copied some computer software at some point in their lives. Most of these uses don't seem illegal or wrong to the majority – and in fact, it is difficult to argue that the manufacturers of those goods are harmed by such localized sharing, since selection is severely limited.

However, many people have engaged in sharing with third-parties as well – an activity that might tend to scale more quickly in severity of economic consequences for the industries in question. The venues available for such sharing – which most users would classify as piracy – prior to the advent of P2P networks, were:

**a) Bulletin Board Systems (BBS's).** These systems were used by a more technically oriented audience in the mid 1980's through the early 1990's. They provided third-party sharing in local geographies. Since teenagers were the most common users, long distance calling was somewhat unusual. The sites were typically created and maintained using pirated software, for the entertainment of the BBS owner. Only software and images were shared through these systems, since the digitization and compression of audio and video were not available on most computer systems. BBS's were distribution channels for groups who would crack<sup>18</sup> software. These anonymous groups cracked software for the challenge, and respect from other groups in the same circles. These sites would typically operate on a ratio system. Visitors would have to upload a certain amount of content – sometimes something the host was specifically looking for – before they would be allowed to download anything. Some of the largest pirate BBS systems were actually raided by authorities in the 1980's, but the aggregate number of users in the United States can only be guessed at.

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<sup>18</sup> Copy-protected software can be “cracked” to allow it to be copied and run by individuals who have not purchased it legally. A crack usually involves a modification to the program's executable code which prevents it from malfunctioning due to the lack of a registration key, manual, or physical copy protection.

**b) FTP Sites.** It is also difficult to estimate how many people used these types of sites. However, their locations and passwords were readily available through contacts in university computer science departments and other technically oriented communities. They also operated on ratio systems for the most part, but since they gained more prominence in the 1990's, they stored pirated music (in MP3 format) and videos (in AVI, MPEG or QuickTime Format) in addition to software. They had a tendency to be removed when the university or corporate network whose resources they were consuming would discover them.

**c) Web Sites.** Pirated goods were – and still are – often distributed through web sites. These sites are more equivalent to the BBS's of the 1980's than FTP sites are. Hosts can put up colorful graphics, write long introductions and create elaborate navigational systems to satisfy their own egos. The primary goal of these sites was twofold: to win fame in the pirate community, and to possibly get money from unscrupulous Internet advertisers willing to pay money for exposure to as many unique users as they could get at a low cost. As such, these sites were replete with pop-up windows, and also often linked to illegally stored content on third-party servers (which quickly removed that content upon discovery). These web sites tend to be very volatile, as they consumer a noticeably large amount bandwidth, and they go down constantly as they are discovered and deactivated.

**d) Chat Rooms.** IRC (Internet Relay Chat) is the most common network, although nearly every major online service (e.g. Yahoo, AOL) offers chat room options. These were the precursor to peer-based file exchanges – in fact, they are closely related. Both systems are actually P2P systems which allow users to communicate and share information directly with one another. The primary difference is that chat rooms required users to type messages to one another and tell each other what files they were looking for. If a user on the room had that file, then they could establish a peer-to-peer session with the seeking user and transfer it. This was an extremely inefficient means of file sharing, but it was the most readily available system to mainstream users. Unlike web sites, FTP sites and BBS's, they did not have to find clandestine lists of addresses and passwords, and did not have to worry about the sites being shut down. However, only about 50 people can be in a single room at once (otherwise the conversations become extremely difficult to follow), and it relies upon the direct generosity (or at least reciprocity) of other individuals – who always have the option of lying or denying a request.

## **2.2 Attitudes By Product Category**

People's attitudes toward sharing information goods with third parties – assuming the existence of an easily usable free exchange – varies by the type of good being shared. The assumption here is that sharing is required in order to download other's goods. This assumption is not always the case, as knowledgeable users can get around such requirements through simple configuration alterations and other technological means. However, for most users who assume such a requirement, there are three primary factors which seem to affect the desire to share:

- **Interest.** Whether or not the individual in question wants free access to others' information goods in that category has the most direct impact on what that person's attitude is toward the idea of sharing of goods in that category. The number of unique products of that type which the person would use, if they had unlimited access to them, is a measure of interest.
- **Risk.** If the likelihood of legal repercussions from sharing a good is high, then a person's likelihood of condoning, admitting, or engaging in that behavior decreases. Similarly, if the monetary value of a given item in a category is high, the risk associated with sharing that category overall becomes higher in people's minds.
- **Network.** The larger the number of people who openly share a specific type of good, the greater the likelihood that a given individual will find that behavior socially acceptable and not require that it occur in secrecy. In addition, the greater the number of titles that would be available to a given person who becomes a part of that network. Finally, the size of the community affects the usefulness or need for third-party file sharing.

Product	Interest	Risk	Network	Willingness to Share with Third Parties
<b>Recordings</b>	Typically High	Low	Large	<b>HIGH.</b> Although even many people who use file sharing software consider it illegal, more people sign onto these services every day.
<b>Motion Pictures</b>	Typically High	Low	Medium	<b>MEDIUM.</b> Not enough people are sharing movies online, and the products are not very high quality. In addition, downloading movie files consumes very large amounts of bandwidth, and requires users to leave their computers on for great lengths of time. But when quality and bandwidth improve, and numbers of users doing this increase, the attitude will be similar to that for recordings.
<b>Gaming Software</b>	Typically High	Low	Large	<b>HIGH.</b> Video games and other entertainment software are shared amongst friends, but also frequently with third parties in file exchanges. These were the most commonly shared goods on BBS's.
<b>Business Software</b>	Typically Low	Medium	Medium	<b>LOW.</b> Although many people share business applications locally, sharing an expensive application with third parties is an act most people consider to be unacceptable. In addition, most people only use a few business titles.

<b>Books</b>	Typically Medium	Low	Small	<b>LOW.</b> Scanning the full text of a book is extremely time consuming and inconvenient at present. Even when technology makes it easy to digitize entire libraries, the time that it takes to read a book means usage cannot scale with availability.
<b>Newspapers &amp; Magazines</b>	Typically High	Low	Small	<b>MEDIUM.</b> People share articles from journals they have subscriptions to with individuals who do not. The third-party small is because the current product changes constantly.

It seems like that if a free exchange for newspaper and magazine content – like Napster, but for those publications – were created, then there would be significant interest from people eager to see the day’s Wall Street Journal, Economist, or other such products which offer high quality but require paid online subscriptions. There is a technological hurdle that would need to be overcome, but the high level of interest and relatively low risk would soon prove to be a strong incentive for large numbers to use such an exchange.

There are also intrinsic qualities of each of these goods which affect an individual’s moral beliefs on whether that product *should* be shared with third-parties. For example, newspapers, magazines and books are often considered “knowledge” whereas software and motion pictures are considered “products”. Because of the familiarity with libraries, and the immense amount of knowledge freely shared through the Web, most people see nothing wrong with sharing what they believe should be in the public domain anyway. Even the US legal system has ruled that libraries may lend out commercial software so long as a notice that copying is prohibited is attached – which the commercial renting of software has been declared illegal. Meanwhile, anything that a user has a strong personal stake in – such as a commissioned piece of art or software — will not likely be shared, regardless of how much interest that user might have in seeing comparable goods belonging to other people. Thus, the network for such products never grows.

## 2.3 Peer-Based Systems

### Peer-based Topologies

Although purists would argue that only networks where every node has equal abilities and responsibilities is truly peer-to-peer (Oram, 2001), for end-users, the effect is often the same. In fact there are two network topologies which allow P2P connections between users:



**Centralized model.** This is the model that Napster followed. All users would connect to a single server (or cluster of servers) which would facilitate their connections with one another. The central server can play one or more of at least three different roles:

1. **Discovery.** A discovery server only stores information about which users are currently connected to the system, and what address to use to contact each of them. Individual peers connect to the discovery server to find out how to get in touch with other peers efficiently. However, all further transactions are conducted directly with the peers and do not involve the central server. The advantages of this system are efficiency and general protection against legal complications. The central server need only be contacted when peers need to find contact information for peers not listed in their current address caches, so actual communication with the central server is fast. In addition, since only contact information is stored on the server, a myriad of applications can be built which utilize this functionality – beyond just file sharing systems. The primary disadvantage is that there are few economies of scale. Searches must be executed by polling single machines at a time, and individual nodes may be hammered by search requests. Instant messaging services such as AOL Instant Messenger and MSN each employ their own set of discovery services to allow users to find one another when they come online.
2. **Lookup.** A lookup server provides the discovery service, but it also provides a centralized search mechanism. In addition to storing the addresses of the machines currently connected to the network, the server also maintains a real-time database of the content currently being shared by each of the users on the system. Any given user can query the central server with a request for a given piece of data, and the server will report which peer nodes contain that data. This is the model that Napster followed. The advantage of this system is that it provides each node access to the entire network's real-time data store.
3. **Content Delivery.** In this model, peers upload their content, or a portion of their content, to the central server, which itself then often provides a higher speed connection for transfer to requesting nodes. There are no peer-based exchanges which operate this way due to vastly greater level of system resources required as well as the possibly greater copyright infringement issues to which such systems might be exposed.

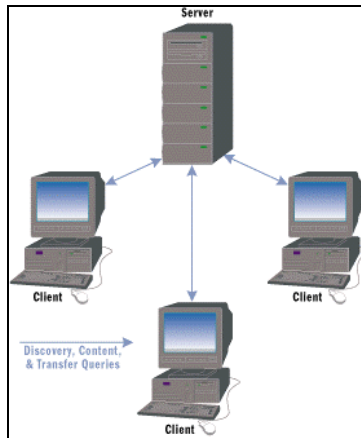


Figure 1: Centralized P2P models require dedicated servers for certain functions. Source: Microsoft.com

**Decentralized model.** The primary disadvantage of any centralized system is that it provides a single point of attack for an adversary – from either a legal or technological point of view. Some systems (e.g. Freenet) avoid this shortcoming by being decentralized in almost all of their functions. In other words, all of the nodes on the network are equal in their feature sets. The disadvantage of this model is that there is no way to tell how many users are on the network at a given time, what the addresses of all of those users are, or what content is available network-wide. For many applications this is not an issue – in a relatively small amount of time, a given node can catalog all of the content available on nearby nodes. Depending on the type of content being served, this might be good enough for most users. But it does not allow the network effect of greater content availability to scale at all.

It should be noted that there is no such thing as a truly peer-to-peer public access network – at least, as of yet. The Internet was designed as a peer-based network, but as it grew larger, it became impractical for every computer to store a list of every other computer on the network, and the DNS system – with 13 root servers – was created. Similarly, although Freenet (and Gnutella) don't use a single centralized server for search functions, they each must receive a list of hundreds of discovery servers from a set of fixed nodes that each node hopes will be up when a given person connects for the first time.

### **Behavior on Different Systems**

Metcalfe's law states that the usefulness of a network equals the square of the number of users. In other words, as users join various free file exchanges, their usefulness grows quadratically. Some of the major peer-based exchanges are:

- FastTrack Network (includes KaZaA and Grokster)
- Gnutella Network (Morpheus, Bearshare, LimeWire, Gnutella, Gnucleus, etc.)
- OpenNap Network (supports 49 different open and closed source client programs)
- Madster (nee Aimster, renamed after domain name decision with AOL)

- IRC (Internet Relay Chat)
- Usenet (the original Internet Newsgroup system)
- Freenet
- Groove
- Scour Exchange
- Hotline
- iMesh
- AudioGalaxy Satellite
- EDonkey2000
- DirectConnect
- FileFreedom

The fact that each of these networks are separate systems (albeit likely with a significant amount of overlap amongst their user bases) indicates that they are individually far less useful than if they were combined into a single network pooling all of the resources. The largest networks are the most useful, and thus continue to attract the greatest amount of new user interest. Napster used this effect to grow at a tremendous rate before its collapse:

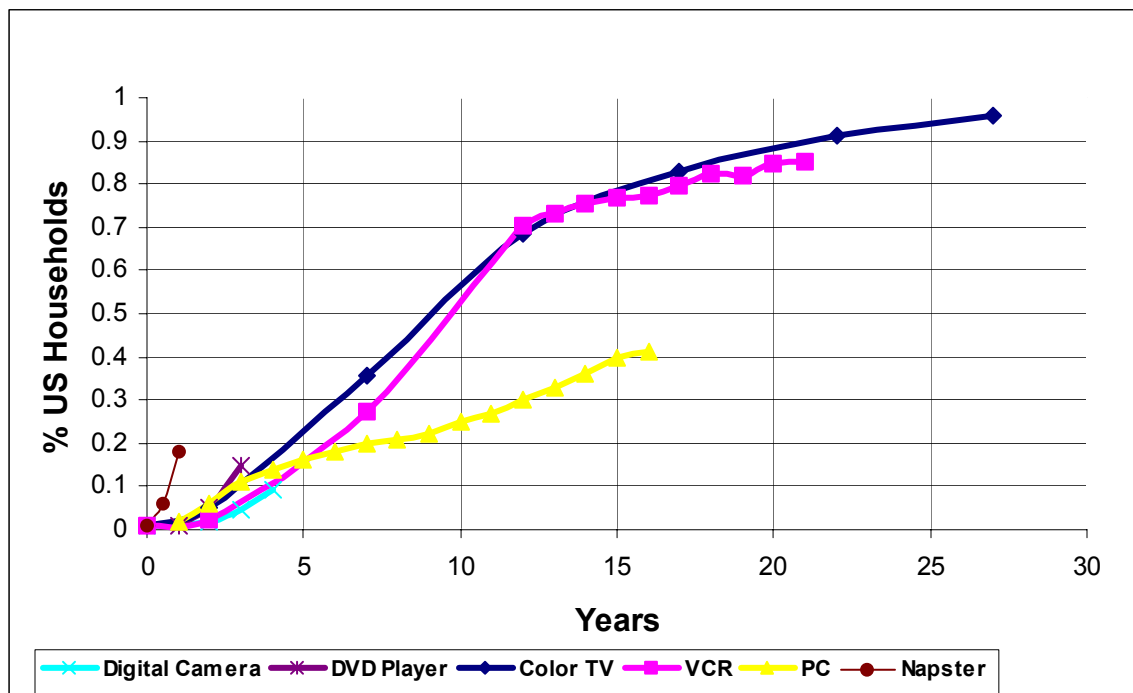


Figure 2: Napster Diffusion Curve.  
 Sources: PMAI, Consumer Electronics Association, MPAA,  
 Paul Kagan Associates, Ebrain Market Research, Infotrends, Jupiter Media Metrix

Morpheus and the KaZaA network have grown even faster. The relative growth (or decline) of Napster, Morpheus and KaZaA in mid-2001 are illustrated below:

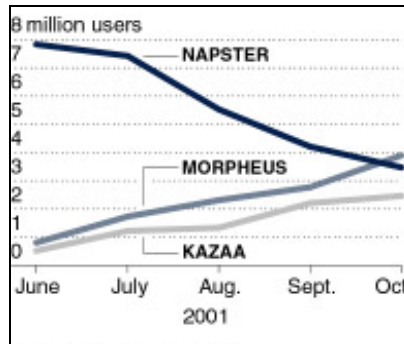


Figure 3: Napster, Morpheus and KaZaA user bases.  
Source: Jupiter Media Metrix, 2001.

As of this date, Morpheus has 90 million registered usernames while KaZaA has 75 million<sup>19</sup>. As people have noticed these phenomenal growth rates, they have created even more systems and networks. While new clients offer new channels to existing networks – providing that those networks are open – new networks actually diminish the utility to users since the total number users on any given network is decreased. A sampling of other systems includes:

<ul style="list-style-type: none"> <li>Abe's MP3 Finder</li> <li>Blocks 0.17</li> <li>Direct Connect</li> <li>Drop Chute+</li> <li>Espra</li> <li>File Cat</li> <li>File Funnel</li> <li>File Topia</li> <li>File Messenger</li> <li>File Navigator</li> <li>FLIPR</li> <li>FlyCode</li> <li>Free Haven</li> <li>GotchaPort</li> <li>Hackster</li> <li>iNoize</li> <li>Interphile</li> <li>Jnapster</li> <li>LeechNet</li> <li>Konspire</li> </ul>	<ul style="list-style-type: none"> <li>Kontiki</li> <li>Media Share</li> <li>mIRC</li> <li>Mojo Nation</li> <li>MyNapster</li> <li>Mytella</li> <li>Napigator</li> <li>Netstreak Assimilator</li> <li>Ohaha</li> <li>OmniPod</li> <li>OnShare</li> <li>OpenCola Smartfolders</li> <li>PeerGenius</li> <li>PlanetFiles</li> <li>Publius</li> <li>Red Swoosh</li> <li>RiffShare</li> <li>Snoopstar</li> <li>Song Spy</li> <li>Splooge</li> </ul>	<ul style="list-style-type: none"> <li>Spin Frenzy XChange</li> <li>Static</li> <li>SwapNut</li> <li>Swapoo</li> <li>Swaptor</li> <li>TekNap</li> <li>Terazima</li> <li>The Leech</li> <li>The Qube</li> <li>Tijit</li> <li>ToadNode</li> <li>Trillian</li> <li>Tripnosis</li> <li>VooDoo Vision</li> <li>VNN</li> <li>Wippit</li> <li>XoloX</li> <li>Yo!nk</li> </ul>
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<sup>19</sup> USA Today, May 9, 2002. "File sharing is a hit, despite legal setbacks."

Despite the multitude of services, the high level of interest in P2P in general generates traffic for each of them. An outage in KaZaA service in 2001 created an opportunity for many second-tier services. That week, Download.com reported<sup>20</sup> 382,000 downloads for iMesh; 214,487 for BearShare; 205,274 for LimeWire; 161,152 for Grokster; and 105,339 for Audiogalaxy.

On most of these systems there are two types of users: those who share files and those who do not. The latter category are often referred to in the jargon of pirate communities as “leeches” due to their tendency to drain files from other systems while contributing nothing themselves. Some systems, such as Freenet, require that all users share a certain amount of system resources in order to have access to the network. However, most users fall into the leech category. The primary reason is the lack of an incentive to share. Unlike the old file ratio systems, most free peer-based exchanges allow users to download an unlimited number of files, regardless of how many unique files they are individually contributing to the network. Most systems instead rely upon subtle trickery to make most users share their files – the programs automatically scan their hard drives and turn file sharing on by default. More important than that, however, is that most industry experts estimate that a very small number of sharers – less than 10% – actually insert new content into the network. Without new content being added, users are merely exchanging all of the same files until everyone possesses, exactly the same database of content. Finally, by distributing the piracy of information goods across thousands of users, these systems have almost completely depersonalized the nature of third party file sharing. While every node is functionally equivalent to its own BBS or FTP site, there is no personalization or login involved, and users are typically not concerned with who they’re downloading from. Thus, the previous motivation for sharing files through BBS’s – ego gratification – does not currently exist on free exchanges.

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<sup>20</sup> CNET: “Outage Points to Depth of P2P Arsenal”, <http://news.com.com/2100-1023-854085.html>

# Chapter 3

## The Recording Industry

This chapter describes the value chains and overall market of the recording industry – focusing on the US market. Reviewing the business model of this industry is essential to the understanding of how free exchanges have disrupted it.

### 3.1 History

Prior to the invention of recorded music at the end of the 19th century, composers were supported under a patronage system, where wealthy individuals who liked a particular songwriter would directly monetarily support that person's vocation. Performers made their money from tickets to live performances, and there wasn't really a music industry to speak of.

Edison's cylinder was introduced as the first phonograph in 1877, and it started the recording industry as we know it today. By the beginning of the 20th century, the phonograph fell out of favor and was replaced by the first 12-inch diameter records. The industry flourished until the 1920's, when record sales began to be hurt by the growing popularity of radio. In the 1930's, EMI was formed and granted a patent for stereo recording. It was not until the 1960's, however, that stereo replaced mono as the standard recording mode.

Over those 30 years, recording quality improved dramatically, 7-inch discs were released, and 8-track cartridges appeared in automobiles. In 1978, Philips announced the invention of the first Compact Disc. Around the same time, cassettes were taking over as the dominant format and the number of LP's sold started to decline. CD sales grew throughout the 1980's, and in 1988 they exceeded vinyl discs in total sales for the first time. By 1989 the LP began to disappear. In the 1990's, Sony introduced the MiniDisc (MD), DVD's appeared, and songs began to be transmitted on the Internet in near-CD quality using the MP3 format. The SDMI (Secure Digital Music Initiative) specification was published by the consortium of the same name with over 160 member companies. The goal was to create a foolproof digital rights management scheme which would allow content to be registered to individual users. In 2000 they issued a challenge to any group to crack their encryption system. A group of Princeton researchers succeeded almost immediately, and their reward was the SDMI suing them to prevent the release of their methods. As of this writing, SDMI has not been able to agree upon a new system for Digital Rights Management (DRM).

**Ruling Against Big 5 Recording Labels.**<sup>21</sup> On May 10, 2000, the Federal Trade Commission ruled issued an order against the big 5 recording labels:

- Sony Music Distribution (“Sony”)
- Universal Music and Video Production (“UNI”)
- Bertelsmann Music Group Distribution (“BMG”)
- Warner-Elektra-Atlantic Corporation (“WEA”)
- EMI Music Distribution (“EMI”)

These five labels control 85% of the recording industry’s \$13.7 billion in domestic sales. The prices for CDs in the 1990’s had dropped as low as \$9.99 in many record stores due to intense price competition. The record labels had come up with a plan to make cooperative advertising payments to record stores to play tracks from certain albums they wanted to promote within those stores. They linked those payments to the record stores not selling albums below a recommended minimum advertised price (MAP). The FTC found this policy collusive under antitrust law and estimated that the Big 5 had extracted \$480 million of illegal earnings<sup>22</sup>.

In 2001, the Big 5 record labels have begun taking steps into the realm of downloadable content. Each of the systems is either in development, or only offers a very limited catalog of tracks for downloading.

In 2002, the RIAA released figures<sup>23</sup> claiming that Internet piracy was responsible for consecutive 5% decreases in the dollar value of worldwide music sales in 2000 and 2001.

## 3.2 Structure

**“Stealing artists’ music without paying for it fairly is absolutely piracy, and I’m talking about major-label recording contracts, not Napster.”**

– Courtney Love, *Digital Hollywood Conference*, 2002.

### Value Chain

The value chain of the recording industry is represented in the following diagram:

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<sup>21</sup> <http://www.ftc.gov/opa/2000/05/cdpres.htm>

<sup>22</sup> <http://www.ftc.gov/os/2000/05/mapanalysis.htm>

<sup>23</sup> [http://www.businessweek.com/magazine/content/02\\_19/b3782609.htm](http://www.businessweek.com/magazine/content/02_19/b3782609.htm)

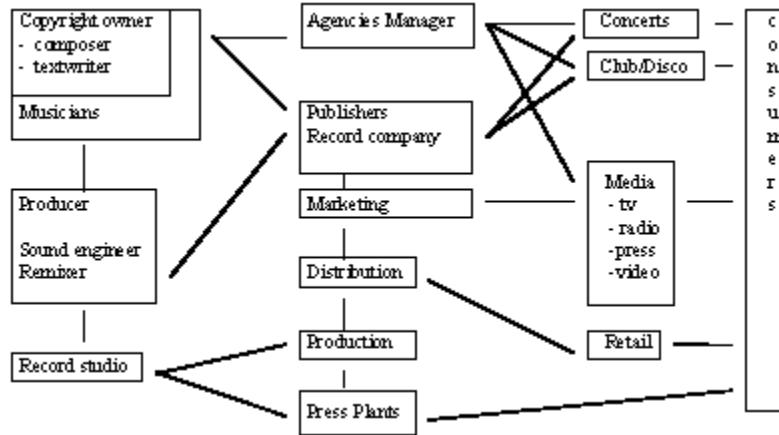


Figure 4: Recording Industry Value Chain. Source: Schulze (1994).

Most people are unaware of how little content creation and promotion contribute to the revenues of the recording industry. In fact, they are less profitable than radio programming and concert tickets (figure 5). Considering the court case mentioned earlier against the recording labels, widespread recognition of this data could cause even further displeasure with the RIAA.

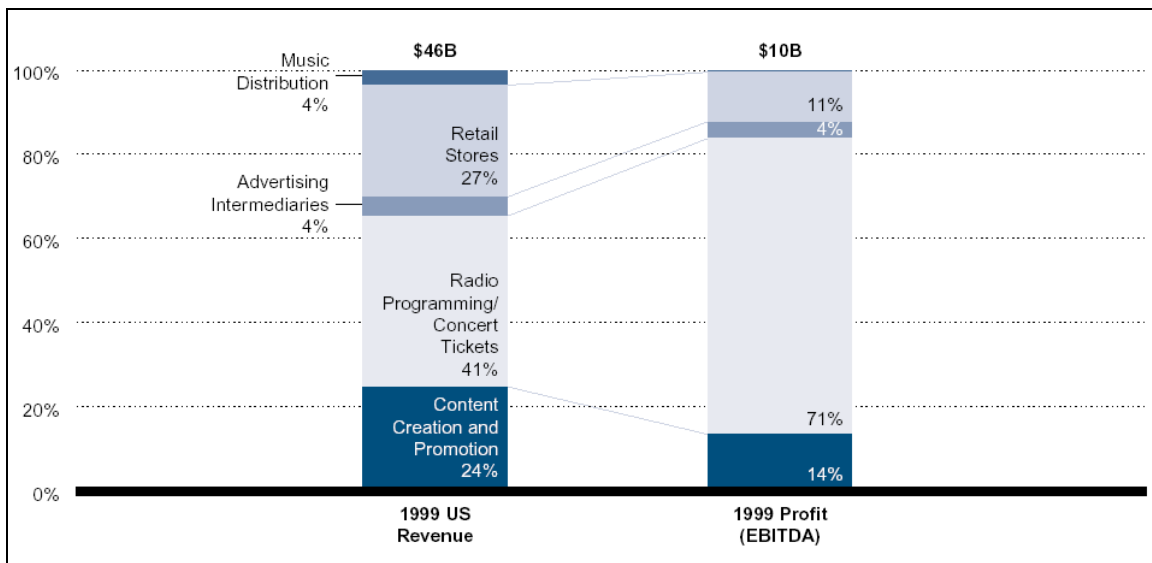


Figure 5: Music Industry Profit Pool.

Source: Singh, Ashish. "Cutting Through the Digital Fog", Bain & Company, 1999.

The data available on how much copyright benefits artists is very limited, but it paints an even worse story for them on an individual basis than for the labels. While artists' base royalty rates



on popular CDs generally range from 10% to 25% of the suggested retail price<sup>24</sup>, a myriad of other issues<sup>25</sup> reduce the overall royalty rate. In the United Kingdom, for example, where the music industry is structured essentially the same as in the US, there are some authors who earn very large sums of money from copyrights. However, the vast majority – over 90% – earned less than £1000 in 1993<sup>26</sup>. Meanwhile, as much as 31% received less than £25.

According to Dolfsma (2000), copyright in the music industry once served the purpose of compensating labels for high search, development and distribution costs. However, in recent years, technology has drastically reduced the costs associated with those activities, and he believes that copyright now serves a largely ceremonial function in the industry. That is to say, it is an institution which prevents the industry from restructuring for the betterment of all. Whether or not this is true is beyond the scope of this thesis, but it certainly presents some serious questions for lawmakers, consumers and artists looking in on that industry.

### **US Consumer Profile**

The RIAA released their 2001 consumer profile survey results<sup>27</sup> in early 2002. They indicated the following facts about the US buyers of pre-recorded music:

- 51% female
- 89.2% of all music items purchases are CDs

The distribution of consumers by age group was evenly divided:

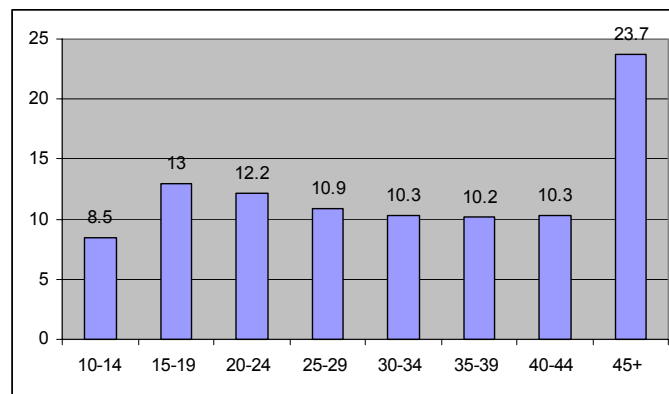


Figure 6: Percentage Age Distribution of Music Consumers

<sup>24</sup> American Society of Composer, Authors and Publishers. <http://www.ascap.com/musicbiz/money-recording.html>

<sup>25</sup> *ibid.* The list of deductions includes free goods, responsibility for the payment of producer royalties; reserve accounts; return privileges; midline, budget-line, record-club, and foreign royalty reductions; 90% sale provisions; new-technology rate reductions (which may even affect CD royalties); cut-out and surplus-copy provisions; video, tour support, and promotion expenses; recording costs; advances; ownership of websites; merchandising rights; and controlled composition clauses.

<sup>26</sup> Towse, 1997, p. 42

<sup>27</sup> <http://www.riaa.org/pdf/2001consumerprofile.pdf>

Compare to US age distribution in those groups:

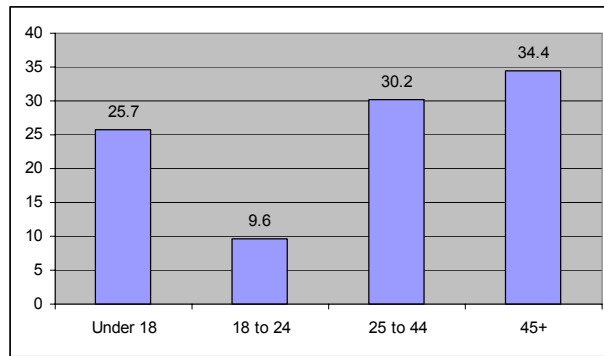


Figure 7: Age Distribution, 10 years old or greater, US Population. Source: US Census 2000.

We see that while 18 to 44 year old individuals account for under 40% of the considered US population (that is, the portion of the US population aged 10 years or older), 20 to 44 year old individuals account for 54% of all music purchased. Meanwhile, those aged 45 years or older account for less than 21% of music sales despite representing over 34% of the US population. US users represent the second-most music-hungry consumers in the world:

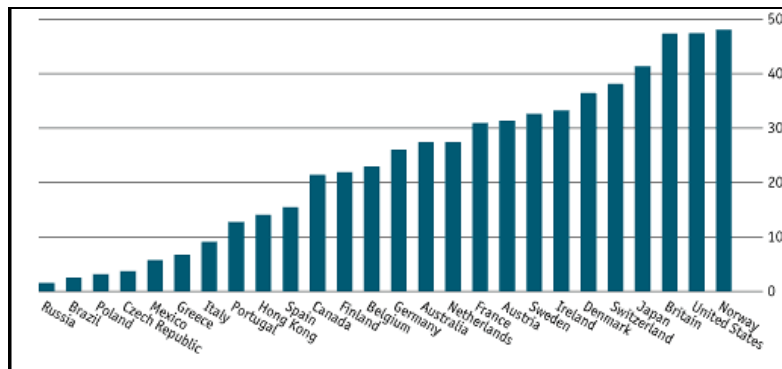


Figure 8: 2001 Per Capita Sales of CDs, cassettes, records, US \$million. Source: International Federation of the Phonographic Industry. The Economist, March 2002.

So how does the Internet figure into this? The most recent data<sup>28</sup> indicates that 55% of the US population, or over 155 million users, currently have access to the Internet. Of those, it is estimated<sup>29</sup> that 10 million have broadband access from home, and an even greater number have access to high speed Internet connections in some form. If music downloads from free exchanges represent a threat to the music industry, the silver lining for the record labels may be in a study of Internet non-users<sup>30</sup>: 57% of those without Internet access don't plan on getting it anytime soon.

<sup>28</sup> Jupiter Internet Population Model. Boardwatch, March, 2002. "Graphically Speaking – US On-Line Users"

<sup>29</sup> In-Stat. Businessweek, March 11, 2002. "Can Sony Regain the Magic?"

<sup>30</sup> Pew Internet & American Life. "Who's not on-line".

[http://www.pewinternet.org/reports/pdfs/Pew\\_Those\\_Not\\_Online\\_Report.pdf](http://www.pewinternet.org/reports/pdfs/Pew_Those_Not_Online_Report.pdf)

# Chapter 4

## Study: Audio File Sharing Users

**Methodology:** This section describes the primary data collected from 23 interviews with industry executives<sup>31</sup>, technologists and end users, as well as 206 questionnaires from selected end users and 1141 questionnaires from anonymous Internet users. The selected end users constituted a demographic mix representative of Internet file sharing users in the United States.

The text of the survey itself is presented in Appendix A. The questionnaire was introduced with the clear explanation that this study was being conducted for an MBA thesis not affiliated with the music industry. Interviews and prior experience had shown that people were extremely wary of being asked questions about pseudo-illegal activity, and the veracity of data from surveys conducted by official organizations is called into question because of this.

A study in April 2001<sup>32</sup> – at the height of Napster’s use – provided the following estimates of the demographics of file sharing users in the United States:

- 30 million individuals had downloaded music online
- 61% of users were male, 39% were female
- 29% of all adult Internet users had downloaded music
- 51% of those aged 18 to 29, and 53% of those 12 to 17 had downloaded music
- Nearly three-quarters of boys aged 15-17 had downloaded music
- 6 million individuals would be looking for music to download on any given day

The income distribution showed that those downloading music consisted of:

- 36% of individuals with incomes less than \$30,000 per year
- 31% of individuals with incomes of \$30,000 to \$50,000
- 29% of individuals with incomes of \$50,000 to \$75,000
- 24% of individuals with incomes greater than \$75,000

The general demographics of these groups were taken into account in the sample space chosen for this study. The individuals chosen constitute, as a group, a proportionately representative

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<sup>31</sup> Ian Clarke of Freenet, Bill Sorenson of Bertelsmann, and 5 other anonymous sources.

<sup>32</sup> Pew Internet & American Life. [http://www.pewinternet.org/reports/pdfs/PIP\\_More\\_Music\\_Report.pdf](http://www.pewinternet.org/reports/pdfs/PIP_More_Music_Report.pdf)

sampling of the age, income, and educational demographics of file sharing users aged **18 to 49**. These users were drawn from New York, California, Massachusetts, Illinois and Texas.

## 4.1 Key Findings

Although the percentages varied somewhat, the majority of anonymous Internet survey responses sided with the majority of pre-selected users on every question where there was a clear majority response. The anonymous users were used to provide a wider range of opinions and reinforce the primary survey results. As such, the exact figures quoted here are from the primary survey, although each of the trends holds true for the larger group polled.

**Napster Was the Golden Standard.** It came as no surprise that Napster was the file sharing system that more users had tried than any other. 78% of users had used it, versus 49% of users who had used Morpheus<sup>33</sup>. While other studies have shown that the Morpheus / KaZaA network had more users than Napster ever did<sup>34</sup>, this just illustrates the explosive growth of file sharing users on the Internet, since there are now many competing networks as well.

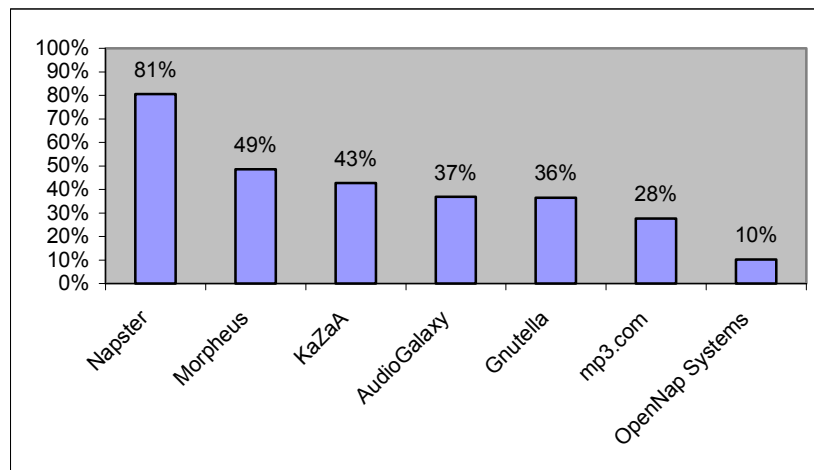


Figure 9: Services Tried By Sample Group A

**CD Purchases Have Declined Amongst File Sharers.** 48% of users reported buying 5 to 10 CDs every year prior to 1998, while 73% purchased 5 or more. In 2002, 53% of users reported buying less than 5 CDs in a year (vs. 27% that reported buying less than 5 in 1998).

<sup>33</sup> The distinction between Morpheus based on the FastTrack engine and Morpheus based on Gnutella was not made, as the majority of users are unaware of this change in the Morpheus application.

<sup>34</sup> Jupiter Media Metrix, 2001.

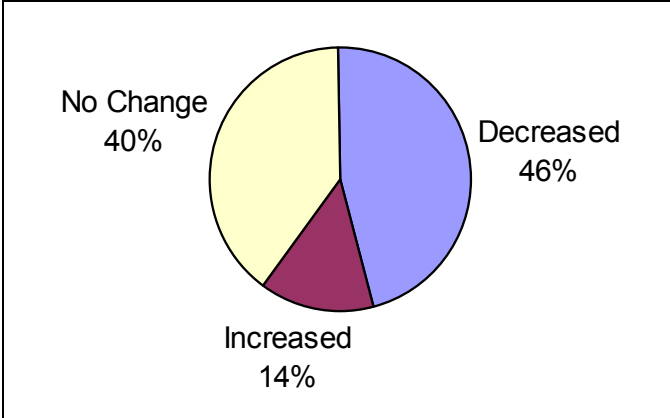


Figure 10: Change in CD purchases, pre-1998 vs. 2002

**Music Downloads Are the Biggest Source of New Music.** 50% of all users reported that greater than 50% of the new music they acquired was downloaded through a free service. A full 44% of users reported that more than 75% of their new music was downloaded through a free service.

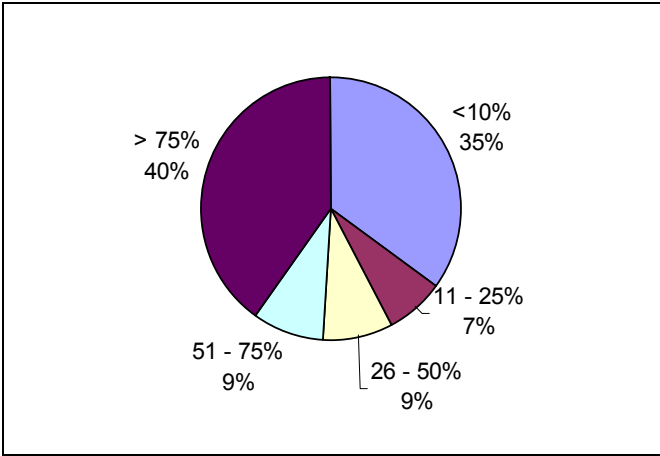


Figure 11: Percentage of new music acquired but downloaded without payment

**High Downloading Rates Do Not Necessarily Cause CD Purchases to Diminish.** There was only a .325 correlation between the current percentage of new music downloaded without payment and the change in number of CDs purchased. Even among users who downloaded more than 75% of their new music, only 25% reported that they purchased fewer CDs at present than they did in 1998.

**Convenience With Self-Interest.** 59% of users agreed that they download music because it's free. 72% of users download music because it's fast and convenient. 61% of users download music because it allows them to get rare tracks. But only 17% of users reported that the belief that music should be shared motivates them to use file sharing systems.

**Cash Incentives, Not Physical Extras.** Only 27% stated that getting free music videos with CDs would make them more likely to buy them instead of downloading songs. Only 15% expressed said the same about better booklets, and only 16% said that exclusive access to areas on band's web sites would provide such an incentive. However, 38% said that free credits for downloading music online would make them more likely to buy CDs, and another 26% were undecided on that point.

**Industry Site Must Be Complete.** 84% of users said they would pay more than \$10 per year for a subscription to an industry site with all major recordings available. 62% would pay more than \$25, 40% would pay more than \$50, and 26% would pay more than \$75. However, users were absolutely not interested in a subscription to a single label's catalog, and 59% indicated that they would only pay less than \$10 per year for such access, while 85% would pay less than \$25.

**CDs Are Overpriced.** 31% of file sharing users said they would abandon file sharing systems entirely if CDs cost less than \$10. 66% would do so if CDs cost less than \$5, and 79% would do so if CDs cost less than \$1. **However, 20% of users indicated that they would not abandon file sharing systems even if CDs were free.**

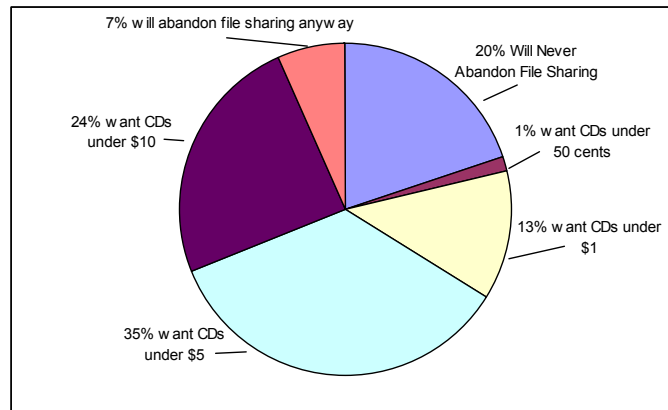


Figure 12: Question: "What price would CDs have to drop to in order to make you abandon free file sharing systems altogether?"

## 4.2 Analysis

If the comments sent in by users had an overarching theme, it was this: everyone has an opinion on this topic. The zeal and length of some comments was surprising, as was the level of displeasure many felt for the recording industry labels. The industry needs to take note of this in every action it takes, since it is plainly obvious that there are many users that already feel justified in engaging in what they acknowledge as mildly illegal behavior simply to teach the big labels a lesson. Further alienation of their core audience would most certainly have disastrous effects, most likely demonstrated through even greater rates of P2P system adoption.

In addition, a pattern may be emerging regarding the adoption of major free exchanges:

1. A new file sharing service is announced.
2. Users flock to that service, and create an instant network effect.
3. The industry recognizes the new network by suing the parent company.
4. When the parent company shows any signs of weakness, users flock to a new file sharing service without legal complications.

This pattern has driven users from Napster to Morpheus to KaZaA. The percentages indicate that the file sharing systems may lose some users each time this happens. Either those users stay with the dilapidated system, or they lose interest in constantly shifting from one system to the next.

While the decline in CD purchases coincides with the increase in free music downloads, this alone does not provide a causal link. It is possible that users have less money to spend now, during a recession, than they did 2 years ago. However, the fact that 40% of users download more than 75% of their new music suggests that user's attitudes toward where they get their music – and the ratio of music they have to music they purchased – has changed. A Jupiter Media Metrix survey has suggested that users who use file sharing systems actually purchase more music than non file-sharers. That study, based on 305 peer-to-peer users, was conducted in early 2001, and disagreed with a survey conducted by the RIAA which indicated the opposite. In fact, the Jupiter study does not seem to make sense, since overall CD purchases have actually declined, and Jupiter's survey indicated that between both file-sharers and non-file sharers alike, sales had increased overall. From the comments expressed by people in the study presented in this thesis, it seems more likely that heavy CD purchasers would be interested in file sharing systems as a result of their greater interest in music. As was noted earlier, however, there does not seem to be a correlation with the amount of music downloaded and the change in purchasing habits. Heavy users of file exchanges purchase fewer CDs than before, but so do light users who continue to purchase the majority of their new music. It would suggest that either any use of file sharing systems make people less likely to purchase music, or perhaps people are purchasing less music now due to other reasons (e.g. economic outlook). Yet another survey<sup>35</sup> indicated that the number of CDs purchased among their sample group had not changed at all since using Napster. However, this was not only not in-line with the general music industry trends, but it also was subject to heavy bias due to the tight demographic concentration of the sample space.

The fact that people like using file sharing systems as a tool is difficult to dispute. But one of the most interesting results here is that although they like all of the features provided by these systems, very few people (less than 1 in 5) are motivated to use these systems because they believe music should be shared. While this does not directly contradict data from other surveys<sup>36</sup>

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<sup>35</sup> University of Southern California Study, 2001.

[http://www.cdmediaworld.com/hardware/cdrom/news/0006/california\\_mp3.shtml](http://www.cdmediaworld.com/hardware/cdrom/news/0006/california_mp3.shtml)

<sup>36</sup> Pew Internet & American Life Project Study.

<http://www.wired.com/news/culture/0,1284,39135,00.html?tw=wn20001002>

which appear to indicate that users believe there's nothing wrong with file sharing, it does indicate that self-interest is the primary motivation of most users. Anecdotal feedback suggests that most users do not believe that third-party file sharing should be outright legalized – and if a legal system were created which provided as much value (perhaps in slightly different ways) as the illegal systems, then the vast majority would be willing to switch.

One popular theory in the music industry has been that in order to stimulate CD sales, record labels need to provide more value to the consumer. It would appear that providing direct incentives – the promise of credits for free downloads – is more compelling than physical extras such as better booklets, functional extras such as bundled music videos, or fan rewards such as exclusive access to artist's web sites. This does not mean that those extras could not be used strategically in a comprehensive loyalty program, however. Certainly different demographics would respond to each of these in their own way.

Whatever online alternative the music industry comes up with, it definitely needs to include access to as wide a variety of tracks as free exchanges provide. In other words, almost nobody is interested in searching for music based on which record label an artist is on. Furthermore, users do not appear to be interested in any crippled service which only offers a subset of their favorite songs (figure 13). Thus, offering only a single record label's collection of music in a market is less efficient for a consumer than simply downloading the track illegally from a file sharing system. On the other hand, if the industry can come up with a comprehensive system which includes all tracks, the market for it could be very substantial, and persuade most users to stop using free exchanges for most of their music.

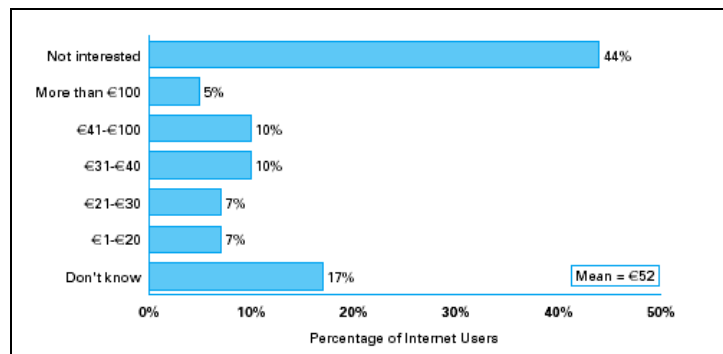


Figure 13: Interest of British users in a top 100 song service. Source: Jupiter Media Metrix, 2001.

Finally, it is clear that users believe that CDs are overpriced. At present levels, less than 8% of users anticipate that they will voluntarily stop using file sharing systems at some point. Meanwhile, another 25% of users would stop if the price of CDs dropped to less than \$10, while yet another 35% would stop if CDs dropped to less than \$5. If by 2005 file sharers represent 50% of acquirers of new music, it's clear that such a price reduction would actually make the industry more money overall. However, by 2005 it might be too late.



# Chapter 5

## Proposal for a New Online Model

This section describes a proposal for a new distribution strategy for the recording industry, and then generalizes the model for all information goods industries. The goal of the strategy is to be able to extract a maximum amount of value from both offline and online markets for the same information goods, in world where free exchanges attempt to make that content available to all users without cost. A new pricing model and file sharing standard are proposed here, as is a strategy for maximizing the benefit and reducing the negative impact of free exchanges.

### 5.1 Pricing Model

Recent studies (Brynjolfsson and Smith, 1999) have indicated that price levels for goods in electronic marketplaces are now lower than for the same goods in conventional retail environments. Two possible implications that might be drawn from this are: a) people may come to expect that they will pay less for a product online, and b) people may be willing to pay less for the given good in any context after being exposed to the lower price. In information goods industries where the price of most titles is comparable to begin with, this phenomenon would make the price differences between channels even more transparent to consumers. As has been noted earlier, the Big 5 recording labels have been engaging in practices in recent years which the FTC considers collusive, and the retail price of CDs has been kept artificially high. As noted in the survey, there are many consumers who are using file sharing systems now simply because of the cost of CDs, who would switch back to CDs if the price was reduced. So it can be seen here that the overpricing of physically distributed versions of information goods drives people to the use of free exchanges. If consumers believe the legal good is egregiously overpriced, they tend to feel less guilty about downloading that good from the Internet. Once they start download goods from a free exchange, it becomes a learned habit. Based on the study, the optimal price for CDs, to maximize revenues from file sharing users who say they would buy more CDs if the price was right, is somewhere from \$5 to \$10 per CD. However, dropping CD prices to \$8 industry-wide would have a catastrophic effect on sales, since file-sharers only account for less than 20% of the general population at this time. At the same time, without a price reduction, an ever increasing number of people will turn to free exchanges simply for cost reasons.

The best solution is to provide an online pricing structure which maximizes revenues from individuals who are willing to forgo the packaging and physical benefits of a CD. The economics of such information goods bundles is vastly different from traditional per-CD prices, or even CD bundling clubs. When information goods are bundled online, a nearly unlimited number of tracks

can be provided for a fixed price, if so desired. It appears that the law of large numbers allows the easier prediction of a consumer's value for a large bundle of unrelated information goods than for the individual goods themselves (Bakos and Brynjolfsson, 1999). Thus, in the case of the music industry, it is difficult to determine what an individual consumer might be willing to pay for a given song from a given artist – but it is easier to predict the value they would ascribe to the right to download a bundle of a certain number of songs of their choice over a period of time.

As illustrated by an analysis from Bain & Company (Figure 14), the potential for reducing costs in digital downloads relative to physically distributed goods is quite dramatic. In fact, the potential is even greater than that illustrated here, since the distribution economies of scale keep building as the number of potential users increases. In addition, the Bain analysis does not take into account the possibility of peer-based distribution, which brings marginal distribution costs even closer to zero.

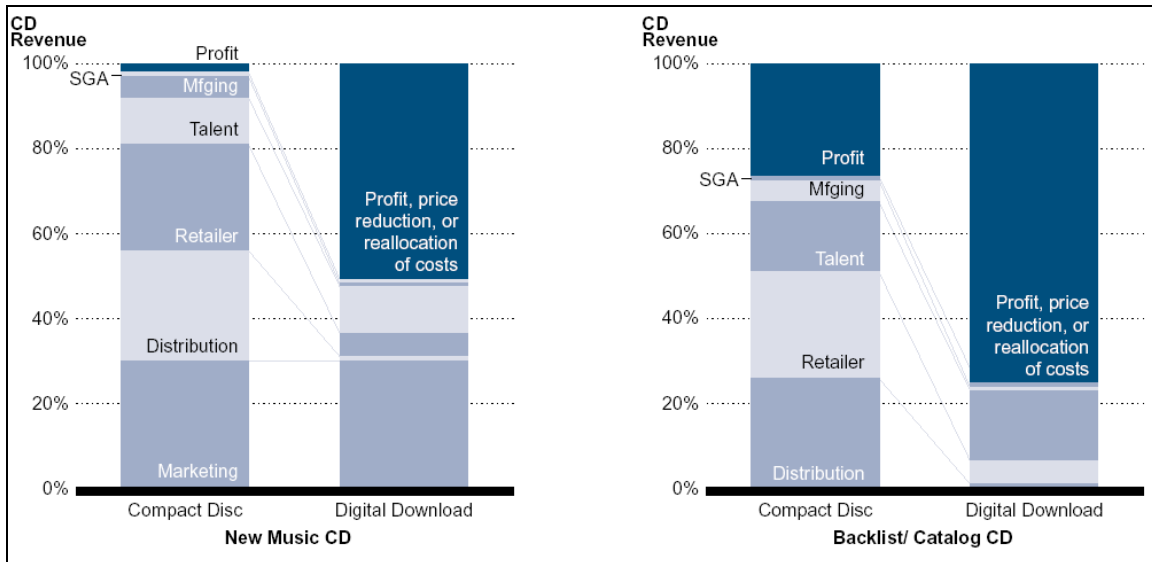


Figure 14: Physical vs. Digital Economics  
 Source: Singh, Ashish. "Cutting Through the Digital Fog", Bain & Company, 1999.

From the study results, it appears that the mathematically optimal price for a yearly subscription-based service is approximately \$110 per year, or slightly more than \$9 per month. At this price level, 26% of file sharing users would sign onto the offered industry-wide service, and generate \$1.1 billion in revenue<sup>37</sup> for the recording industry.

However, this price level is likely not strategically optimal, since the remaining 74% of users would continue to use free exchanges, which would make those exchange more powerful, with a larger peer-based network than the commercial one. This would create a barrier to adoption of

<sup>37</sup> Based on a growth adjusted estimate of 40 million audio file-sharing users in the United States alone.

the commercial network by non-users, and prices would eventually have to be reduced to entice them – but by that point, it might already be too late. A superior initial price level is approximately \$38 per year, or just over \$3 per month. At this level, 62% of file sharers would sign onto the service, and generate \$944.5 million in revenue per year.

However, these numbers would likely be much higher in practice than indicated in the survey. A viable commercial file exchange with a psychologically comparable monthly access fee of \$4.99 for unlimited downloads could market itself based on its reach, legality, and other value added services that users in the survey were not able to envision or experience. In addition, individuals who abstain from illegal file exchanges on moral grounds could be convinced to join for price and convenience reasons. At that price point, if 70% of current file sharers signed onto the system, this would generate revenues of \$1.7 billion – or more than 10% of the recording industries current CD sales revenues, from approximately 18% of its current US audience alone. Since this segment is far more profitable than physical CD sales, as more users adopted online distribution, the more profitable the recording industry would become, while offering even greater value to consumers than ever before. When the entire world market is considered – where they may be as many as 200 million file-sharing users – such a system could generate nearly as much revenue in its first year as all US CD sales – and far more profit.

## 5.2 Commercial Exchange Standard

It can be accepted as a truism that, *ceteris paribus*, consumers will purchase a good through the channel that provides them with the greatest amount of value. This value can be measured along many different dimensions including, but not limited to:

- Convenience
- Selection
- Ease of Use
- Price
- Trust
- Value-Added Services
- Personal Preferences

The primary distribution model that most providers of information goods have supported this far has been various forms of Superdistribution<sup>38</sup>, defined as the protection of an information good through various security techniques including encryption and tracking, to allow for that good to be freely transferred across an open network, but only used by authorized parties. While this approach can work well for computer software, which by its nature is interactive, it is more

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<sup>38</sup> Mori, R. and Kawahara, M. “Superdistribution The Concept and the Architecture”  
<http://www.virtualschool.edu/mon/ElectronicProperty/MoriSuperdist.html>

problematic when dealing with commoditized sensory information goods such as music. The problems include:

- **The Security Does Not Work.** To date, no encryption-based distribution system has been proven to be unbreakable. The recording industry invested heavily in the SDMI standard, and after their security was broken, they did not recover from the technological blow and public relations fiasco, and a new standard has not been agreed upon to date.
- **The Security Cannot Work With Commoditized Sensory Information Goods.** So long as an individual can put a microphone up to speaker, music can be digitized in high quality and made available in an open format such as MP3.

*“There is no scientific way to keep music from being copied. The science of encryption is very good at keeping a third party out of a conversation. I have to trust the recipient. So all the security encryption that exists in the world today trusts the recipient, and no fundamental research has been done on how to secure something from an untrustworthy recipient.”* - Gene Hoffman, President Of E-Music, NY Press Arts & Listings, July 21-27, 1999.

A more sophisticated approach would be to create a sound card driver which sends raw audio output to a file rather than to the computer’s speakers. The likelihood that an individual – or a group of individuals – would create such a system depends on the amount of content in the closed format. In other words, if thousands of file were available in a new SDMI standard, it is a virtual certainty that many workarounds would be developed to allow even non-technical users to “rip” encoded songs into unprotected MP3’s. Such systems need not even reverse engineer the logic associated with the security standard in question – they merely rely upon capturing the resultant waveforms. But it is also very likely that any immensely popular Superdistribution scheme can and will be cracked, and that the crack will be made available on public forums. This has been the case with Adobe’s and Microsoft’s standards for electronic books, for example. While such reverse engineering may be illegal under the DMCA, that legislation has no jurisdiction outside of the US, and even within the US, access to international software workarounds is conveniently available through the Internet.

- **Security Burdens Legitimate Users.** Superdistribution schemes have been criticized by some as trying to bring the inconvenience of the real world into the virtual world. In fact, they bring even greater inconvenience than the real world, in that they attempt to prevent the sharing of information goods even in small communities. In the real world, although there are significant costs associated with sharing a good with thousands of third parties, it is still relatively trivial to make single copies in the realm of fair use. Superdistribution schemes, in an attempt to prevent the first form of replication, also make the second more of a hassle for legitimate users, if not impossible in some cases. Another type of security, physical copy-protection schemes on CDs, has caused problems in thousands of machines, including CD players that cannot play the content, and Apple computers that

become locked to users when the discs are left inside their CD-ROM units. Ultimately, if such a system becomes standard, it will again create an incentive for users to circumvent the security in a widespread, standardized way, and trade the converted open content on free exchanges.

Another major issue to consider is that the “genie is out of the bottle” regarding MP3’s, and it is extremely difficult, if not impossible, to put it back. Not only do many users have extensive collections in MP3 format, but the number of hardware devices with built-in MP3 support is growing dramatically. As consumers personally invest in such technologies in increasing numbers (see figure 15), convincing them to buy entirely new equipment just for the sake of using a standard which is *less* convenient to them becomes a difficult task – especially if free exchanges provide the same files, at a lower cost, in a far more convenient format.

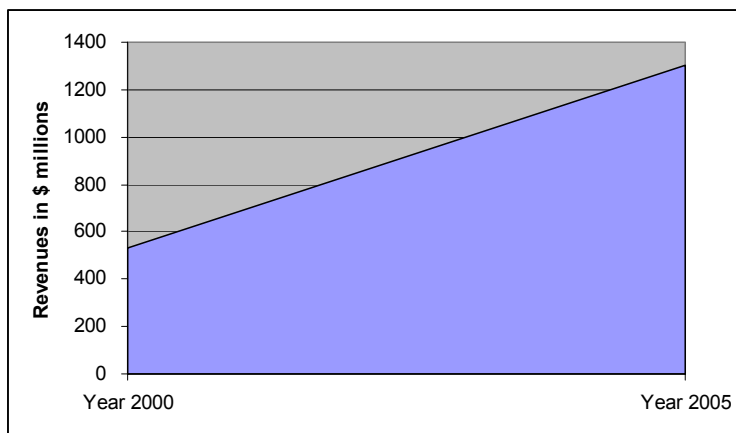


Figure 15: Forecast Market for Portable Digital Music Players. Source: In-Stat, Nov. 19, 2001

For all of these reasons, the distributors of commoditized sensory information goods – particularly audio recordings – have no choice but to distribute their product using open standards, such as the MP3 format. No closed standard will be accepted by the largest portion of consumers so long as it makes fair use more difficult than an open standard. Insisting on closed standards will simply encourage people to continue to use free exchanges – and the primary goal of a commercial distribution strategy should be to *dissuade* as many consumers as possible from using illegal systems.

### **Proposed Technological & Economic Model: Open Clearinghouse Networks**

For a commercial distribution system to be successful, it must provide enough value to convince a significant constituency of users to choose it over free exchanges. The model proposed here is for a network of open clearinghouses – which essentially provide a superset of the functionality of free exchanges while providing higher quality content and more efficient distribution.

The basic idea is that it should be a peer-to-peer file sharing system which filters content based on identifying markers for each unit. In the case of the recording industry, examples of such

identifiers include track name, track length, genre, artist name, album, and label among many others. While users are free to share whatever files they want on their hard drives, when searches are executed on one of these identifying markers, the system returns “official” versions of matched content from the legal owner of those materials. In other words, if a user searches for “Michael Jackson, Beat It”, the only matches which will appear will be the official tracks and albums from Sony. When a user clicks on the matching song, they will be guaranteed that the song is the track that it claims to be, that it is available from the listed servers, that it is digitized in high quality (perhaps with a range of options), and is free of recording defects. None of those guarantees are currently provided by free exchanges, and providing them in some ways undermines the ability of free exchanges to function and grow, not to mention opening them up to direct legal issues of a nature to which they are otherwise not exposed.

For a commercial system to be able to provide more value than free exchanges, and gain the critical mass necessary to become the preferred channel of distribution, it needs to be as open as possible, in five important ways:

1. Open Storage Format
2. Open Commercial Membership
3. Open File Sharing
4. Open Payment
5. Open Competition

**Open Storage Format.** The system must distribute information goods in the most convenient format for end users. If a closed system is used instead, many potential legitimate users will choose free file exchanges for the greater level of convenience, for the reasons describe earlier in this section.

**Open Commercial Membership.** Any legitimate owner of copyrighted information goods in the same product category must be allowed to easily join the exchange, publish the description of their libraries, and receive compensation commensurate to the number of online downloads for their goods plus their direct involvement in supporting the exchange. In addition, this circumvents possible antitrust issues. In the Napster case, Judge Patel cited the possibility of significant antitrust issues arising from the Big 5 record labels threatening all online competitors with lawsuits while themselves launching their own sites. Large recording labels must be content to make their share of money from the immense popularity of their libraries of recordings. In addition, they may translate their distribution role to the online economy by providing fast servers and other support mechanisms to commercial exchanges. It is likely that resellers will also be permitted to join these exchanges – thus a given good may be offered in many different price and feature bundles from different online sources, all of which are legitimate and verified.

**Open File Sharing.** The only way that a commercial exchange can be successful is if it offers the widest selection of any system, as the study shows. While open commercial membership allows any group to protect their content and benefit from its use, the de facto policy on the

system must be to allow the sharing of all non-protected files. In other words, if a major music label refuses to participate in the exchange, its files will be shared for free. While there are legal challenges which would be made to such a system, it is the only viable means of competing with free exchanges, which by definition support the trading of all content. The study conducted reveals that users are simply not interested in shopping for music based on a subset of offerings. Consumers do not set out with the intention of buying a song from a given music label, and are usually completely unaware of which label they should go to in order to access the content for a given artist. The only way for consumers to conveniently find the content they are looking for is to search a system which integrates all of the content from all of the providers into one search mechanism. Anything less – even perhaps 99% but not 100% of the content being supported – creates a rationale for using free exchanges just on the basis of selection alone. The key here is that while free sharing creates a strong incentive for all users to search the commercial exchanges first, it also creates similar incentives for all recording labels – and artists – to register with the commercial systems, control their content, and benefit from its use.

**Open Payment.** Approximately 15% of adult Americans do not have bank accounts, and over 20% do not have credit cards<sup>39</sup>. Teenagers and young adults, who represent a disproportionately large percentage of the market for audio recordings, have even less access to these instruments. And yet, every commercial music system which has been proposed has relied upon either credit or debit payment mechanisms. If a commercial exchange required these as the only available methods of payment, it would lose all of the people who lack these instruments to free exchanges. While the demographics of adults without bank accounts or credit cards does not overlap significantly with those who have Internet access, the number of teenagers with Internet access but without credit cards is obviously significant. In order to capture as much of that market as possible, open payment systems – such as accepting pre-paid online music cards which can be purchases with cash in music stores – should be developed and encouraged. In addition, the study conducted in this report showed that bundling online credits with physical CDs was the most compelling of all “extras”, and could provide further incentives for consumers to go to music stores for some goods while downloading others online.

**Open Competition.** Finally, these commercial exchanges should be created in such a fashion that multiple legitimate exchanges, each with their own set of features, can compete against one another. This is necessary not only for long-term antitrust reasons, but also to once again provide the maximum value for both the consumer and the recording labels. For example, a Napster-client based exchange might have certain characteristics (e.g. search and upselling capabilities, pricing plans) which differ from a KaZaA-client based exchange. The competing exchanges might look different and provide a different experience to consumers as well as different compensation schemes for labels and retailers that authorize content.

Ultimately, a system such as this empowers users, artists, and even labels, while conforming to ideals such as the Digital Consumer Bill of Rights<sup>40</sup>. It would possess the combination of brand

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<sup>39</sup> McKinsey & Company, 2000

<sup>40</sup> <http://www.digitalconsumer.org/bill.html>

loyalty and network effects that simulation models have shown to be the most successful Internet markets.<sup>41</sup> Only 26 percent of users have said they trusted e-commerce sites most of the time<sup>42</sup>, and building systems where every major player in the industry endorses their use will go a long way toward signaling reasons for trusting such systems. In addition, supported spyware-free clients<sup>43</sup> provides yet another reason for consumers to trust commercial exchanges over pirateware<sup>44</sup>-supported free exchanges. Each of these open standards provides different types of value to the consumer, leaving fewer reasons for any given consumer to *not* want to use a commercial exchange over a free one.

### 5.3 Strategy for Free Exchanges

No matter how powerful and convenient a commercial network is, there will be a segment of the population that simply wants to get its music for free. That segment is typified by individuals whose time is far less valuable than their money – children (especially boys in their late teens, according to the study previously cited) are a good example. In addition, free exchanges, if simply ignored, may grow into threats to commercial exchanges based on network effects alone. Finally, simply legislating the online piracy of music, or other goods, as illegal does not seem to have any effect in a world where people in increasing numbers accept that behavior socially.

Instead, commercial providers of information goods must adopt an active strategy for interacting with free exchanges. First of all, a free exchange is only a legitimate threat to an open commercial one if it has a very large number of users. The network effect from small exchanges is minimal to the point that it does not really provide the same kind of service, so they do not threaten commercial exchanges to the same extent. Within the larger free exchanges, however, an interesting usage pattern exists. From the study, we see that very few users are dedicated to explicitly logging onto such systems to share content – downloading others’ content is the primary application. Since less than 10% of users are providing over 90% of each network’s content, a rough calculation estimates that a system of less than 1000 machines could “police” a free exchange on a worldwide basis. In other words, if there were 1000 high speed servers with very large amounts of *false* content being published to a given network, it would dramatically decrease the usefulness of that exchange for the vast majority of users by decreasing the signal to

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<sup>41</sup> Ogus, Ayla; de la Maza, Michael; Yuret, Deniz. 1999. “The Economics of Internet Companies.” Proceedings of *Computing in Economics and Finance 1999*, Meetings of the Society for Computational Economics, June 24-26.

<sup>42</sup> Consumers Union Study, 2002.

<sup>43</sup> Spyware, broadly defined, is software which surreptitiously sends details about users’ usage habits to a monitoring organization. In February of 2002, it was revealed that KaZaA’s Media Desktop was shipping with automatically installed software from Brilliant Digital which could be activated remotely to connect all KaZaA users’ machines together into a distributed computing network. This network, called Altnet, could be used for whatever purpose Brilliant desired. Altnet: <http://www.brilliantdigital.com/content.asp?ID=779>

<sup>44</sup> Pirateware: freely distributed software created and supported by non-commercial organizations or groups for the express purpose of facilitating intellectual property piracy in some form. Included in this category are cracks, most ratio FTP software and many third-party file sharing systems.



noise ratio of that service.. A company called MediaDefender has created such technology, and experts believe it is the only viable means of neutralizing the effectiveness of free exchanges<sup>45</sup>.

This strategy would require the involvement of one of the major recording labels, or an interested third party of great financial strength. However, such a strategy would have dire public relations consequences for a recording industry which has already been reprimanded for collusive practices and is also attacked by artists for unfair payment schemes. Downloading “garbage” content obviously placed on free exchanges by commercial recording labels would intensify the animosity which many feel towards them, galvanize them against the commercial alternative, and encourage fringe groups to organize and come up with better technologies to defeat the practice of “file spoofing” sooner rather than later.

Instead, commercial content providers should take advantage of the fact that free exchanges can be used for promotional purposes. Instead of releasing “garbage” content with false artist and title information, they can release “demo” versions of tracks which allow users to sample the content, but for most people it would not serve as a substitute for downloading a perfect, high-quality version of that song. Various mathematical techniques can be used to make a demo version appear to a file exchange system as being equivalent to illegal high quality versions of the same file – for example, it can be encoded at the same bitrate, but with random noise inserted at various sequences, or have the sound quality degraded overall to a level below AM radio. These are suggestions, and the exact level of quality required to ensure it would provide the highest level of value without substituting for the paid good would have to be determined through careful study.

### **Prevailing In An Unwinnable War**

These strategy for utilizing free exchanges would definitely alienate some segments of the community that believe that information should be free<sup>46</sup> and that recording labels publishing “demo” content is an attack on their network. This would result in an arms race, as new file exchange systems would come into being which validated content using some distributed mechanism. Commercial content providers would strike back with more sophisticated technological techniques as well as more concentrated legal attacks. Eric Scheirer of Forrester Research predicts “show” lawsuits against almost randomly selected file sharers<sup>47</sup> which would definitely change the societal norms and perceptions of risk regarding file sharing. However, every time a new file exchange application would come into being, the network of such systems becomes more fragmented, more users get frustrated, and some users are left behind with each upgrade. Meanwhile, the commercial networks don’t go anywhere, and look like an even better alternative for most users with each iteration of this cycle. By the time that a “perfect” micro-piracy system is perfected, the vast majority of users will already be accustomed to using

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<sup>45</sup> <http://zdnet.com.com/2100-11-525531.html?legacy=zdn>

<sup>46</sup> <http://www.anu.edu.au/people/Roger.Clarke/II/TWtbF.html>

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<http://www.nytimes.com/2001/12/31/technology/ebusiness/31TECH.4.html?ex=1010466000&en=a2c1ac2acb931e68&ei=5040&partner=MOREOVER>

commercial exchanges at prices they are willing to pay, and will simply lack the incentive to switch to an illegal system which provides them with less service.

## 5.4 Analysis

Many experts believe that the future of marketing is trust-based<sup>48</sup>, and Urban, Sultan and Qualls assert that the best ways to build trust on an online site consist of six measures. Here is a comparison of how the proposed system fares against free exchanges along those dimensions:

Trust Measure	Proposed Model (Recording Industry)	Free Exchanges
Maximize cues that build trust on your web site	✓ Industry-supported systems could draw trust from all other channels as well as provide a web-based interface with full legal support.	✗ Spyware, lawsuits and the general underground nature of these exchanges minimize the level of trust from users.
Bundling of prevalent titles into packages	✓ Bundling is possible, and essential to the idea of upselling on related goods.	✗ Files are not cataloged in an a coherent fashion, and downloading in bundles is not supported.
Use virtual advisor technology to gain customer confidence and belief	✓ Since the content is owned and provided by participants in the system, it is easy to use their databases to create advisors based on genre or other factors.	✗ Files are not cataloged in an a coherent fashion, and organization of material is completely non-standard.
Provide unbiased and complete information	✓	✓
Include competitive products	✓	✓
Keep your promises	✓	✓

<sup>48</sup> Urban, G., Sultan, F., Qualls, W. "Placing Trust At The Center Of Your Internet Strategy" (Brynjolfsson and Urban, 2001).

Obviously, for consumers who care about trust issues, a commercially supported system offers important benefits over free exchanges. In addition, it offers important benefits over the proposed new Napster model (which will likely never be implemented due to Napster's legal and financial difficulties at this time), and other online commercial models such as Musicnet (from AOL Time Warner, Bertelsmann and EMI) and Pressplay (from Sony, Universal and EMI). Each of these commercial systems only make content which is licensed for the system available for sharing. This means that independent artists cannot upload content, users cannot download content from non-participating labels, and overall these systems provide a vastly inferior overall experience which consumers have shown they will reject in favor of free exchanges. Both the study results as well as the lack of success of these services illustrate this.

One of the biggest barriers to the proposed system being implemented is the psychological aversion many in the industry have to the idea of distributed unprotected digital content. The belief is that if labels made their entire libraries available in MP3 format, then users with subscriptions would simply download vast quantities of that content and then share it on free exchanges. There are three reasons why this is not a concern:

1. **It Won't Happen.** The commercial system proposed is far superior to the free exchanges in nearly every dimension, and certainly in terms of overall value. Users lack the incentive to participate in free exchanges when they have very low cost access to the commercial exchanges which are easier to use, provide higher quality content, and are legal. Since the commercial exchange system proposed supports the free sharing of all content which is not licensed by an IP holder, even specialized use ceases to be an argument for free exchanges, since the commercial service offers a superset of the same functionality.
2. **Security Would Not Prevent It.** Those who want to share encrypted tracks can crack those tracks in large batches using the methods presented earlier in this chapter and then upload the open format files to a free exchange. As argued before, this would then slow the adoption of commercial exchanges since free exchanges provided easier to use goods.
3. **The Channel is More Important than the Goods.** Even if some users do this, the key to the success of this model is that the commercial system still provides far more value, and the vast majority of users would not waste time on a free exchange with so many drawbacks (which would also have content controlled using the system outlined) providing that the commercial service provided them with more net value. Collecting subscriptions from these users is far more profitable than taking great pains to prevent any unauthorized copying anywhere – which is also impossible to achieve.

Overall, this system stands to be successful because it addresses each of the concerns raised by every stakeholder in the recording industry – executives who want to get online revenues, artists who wish to be compensated more fairly, and consumers who want more value, greater selection and superior service.

# Conclusion

**“I think that the Internet is going to effect the most profound change on the entertainment industries combined. And we're all gonna be tuning into the most popular Internet show in the world, which will be coming from some place in Des Moines. We're all gonna lose our jobs. We're all gonna be on the Internet trying to find an audience.”**

– Steven Spielberg

There are many factors – legal, social, and economic – which are shaping how society views and interacts with information goods. While the recording industry is the first industry affected so dramatically by recent technology, the motion picture industry is subject to almost the exact technological threats, and protected only by a buffer of time until last mile bandwidth and storage space increases to allow a full length motion picture to be downloaded in the same amount of time as users currently download music. But technology offers other peer-based benefits as well. Digital cameras and audio/video production software allow individual artists to create high quality content which required expensive studio access in the past. Spielberg’s opinion of the future is shared by many, and the Blair Witch Project showed how even a good created using such means can now capture a global audience.


**“The flat-fee pull world is the way music is headed. Music will be a service, not a product. As wireless connectivity delivers what the user wants, whenever they want it, the desire to own ‘molecules’ decreases. MP3’s will gradually fade as a downloadable medium, as bandwidth increases and users have the ability to stream content.”**

– Jim Griffen, formerly of Geffen

There is no question that users are becoming used to having access to a vast collection of music at all times; this is a consequence of not only P2P systems, but also of our society becoming accustomed to having access to a vast amount of information of all types through the Internet. But while a CD containing the entire Encyclopedia Britannica would have been tempting to copy for personal use 10 years ago, having constant access to such references available online means that almost nobody has the desire to copy all of the content onto their hard drives. Instead, these information services become a resource which they tap into whenever they need it.

The same is likely going to be true for all information goods, including music, motion pictures, documents and software in the long term. The trends toward video on demand, ASP’s, web services and audio streaming are precursors to an age when all of this information is available from any location. Of course, 3G (or 4G) is regarded as faraway dream by many, and until widespread high-speed Internet access in devices of all sizes with near infinite battery life becomes common, there is a lot of money to be made allowing this content to be downloaded in a convenient form.

# Appendix A: Digital Music Survey

	<b>1 Minute Digital Music Survey</b>
<p><b>If you have ever used MP3 audio files, we are interested in your opinions.</b></p> <ul style="list-style-type: none"> <li>• The purpose of this survey is to gain a better understanding of how people acquire their favorite music.</li> <li>• All results will be kept strictly confidential, and no personal identification information is stored by this server.</li> <li>• If you have any questions, contact me at <a href="mailto:sg@mit.edu">sg@mit.edu</a>. Thanks for participating!</li> </ul> <p>– Shuman Ghosemajumder, MIT Sloan School of Management</p>	

<b>Which of the following systems have you ever used to download music files?</b> (check all that apply)	<input type="checkbox"/> Napster <input type="checkbox"/> Audiogalaxy <input type="checkbox"/> KaZaA <input type="checkbox"/> OpenNap (e.g. WinMX) <input type="checkbox"/> Morpheus <input type="checkbox"/> MP3.com <input type="checkbox"/> Gnutella (Bearshare, etc.) Other: <input type="text"/>
<b>On average, how many CDs did you buy every year, prior to 1998?</b>	<input type="text" value="Please select..."/>
<b>On average, how many CDs do you buy every year now?</b>	<input type="text" value="Please select..."/>
<b>What % of new music in your collection every month do you currently download from a free service?</b>	<input type="text" value="Please select..."/>
<b>What % of new music in your collection every month do you think you will download from a free service 5 years from now?</b>	<input type="text" value="Please select..."/>
<b>Why do you use file sharing systems?</b>	<p>(1 = strongly disagree, 5 = strongly agree)</p> <p style="text-align: center;">1 2 3 4 5</p> <p>Free Music    <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p> <p>Speed &amp; Convenience    <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p> <p>Access to Rare Songs    <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p> <p>Believe Music Should be Shared    <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p>
<b>How much (in US Dollars) would you be willing to pay for a YEARLY subscription to an industry supported web site, with a COMPLETE catalog of all recordings ever made?</b>	<input type="text" value="Please select..."/> (Assuming you have unlimited rights to the music you download, and can listen to it on any device, but not share it with others)
<b>How much (in US Dollars) would you</b>	

<p>be willing to pay for a <b>YEARLY</b> subscription to a single record label's (e.g. Sony) catalog of approximately 500 commercial artists?</p>	<p>Please select...                  (Assuming you have unlimited rights to the music you download, and can listen to it on any device, but not share it with others)</p>
<p>I would be more likely to buy more, or most of my music on CD if they:</p>	<p>(1 = strongly disagree, 5 = strongly agree)</p> <p>1 2 3 4 5</p> <p>A. Included videos I could play in my DVD player or computer <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p> <p>B. Came with better booklets <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p> <p>C. Provided access to exclusive content on artists' web sites <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p> <p>D. Provided credits for downloading on-line music <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/></p>
<p>What price (in US Dollars) would all commercial CDs have to drop to for you to abandon "illegal" file sharing systems entirely?</p>	<p>Please select...</p>
<p>To help us interpret this data, please provide some anonymous details about yourself. <b>NOTE: this server does NOT keep any IP logs, and your identity cannot be determined from, or linked to, these answers.</b></p>	<p>Gender <input type="radio"/> Male <input type="radio"/> Female</p> <p>Age Please select...</p> <p>Income Please select...</p> <p>Education Please select...</p> <p>Country United States of America</p>
<p>Where do you listen to music you have downloaded?</p>	<p><input type="radio"/> Only on my computer</p> <p><input type="radio"/> Burn onto CDs, MDs, etc.</p> <p><input type="radio"/> MP3 Player (portable, car player or stereo unit)</p> <p><input type="radio"/> All of the above</p>
<p>Do you have a high speed connection (faster than dialup)?</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>
<p><b>Comments:</b> (Optional) Explain what you think of the current trends in digital music, why you use or don't use MP3 files, and in why you download some music and purchase others. Or just give feedback on the survey!</p>	<p><input type="text"/></p> <p>Submit Answers    Reset Form</p>

## Representative Sampling of Survey Comments

1. I have stopped purchasing altogether and only download free music.
2. If the price of music was cheaper, I'd abandon free file sharing. Back catalogue recordings should sell for less than \$5, new stuff for about \$10. The music industry has milked us for far too long. It is now their turns and they don't like it. Free music sharing is here to stay and will never go away. Too many people have had their appetites wet.
3. The thing that bothers me about music sharing services is the attitude of entitlement of the users. Napster didn't put the artists ahead of the record companies: it put consumers ahead of the artists. In The Netherlands CDs are outrageously expensive (18 to 20 Euro, which amounts to \$ 16-18). After buying more than 500 CDs the last ten years I'm more than fed up with the monopolistic practices of Dutch record companies. It has been proven that the companies would still make money if they halved the price. In the long run, I think that artists will make nearly all of their money from performing live rather than recording albums in the studio, which is the way it should be. Please make this Comments text box larger.
4. We don't have to think in terms of CDs anymore. It's too limiting for many music lovers to be presented with a CD which is the compilation of someone else. I think in track-only terms. I won't keep a CD where I dislike even one track.
5. Record companies have to face the fact that downloading music is a better sales channel than CDs. Okay, not yet, and for that they can thank the slow arrival of broadband. But it will. And very soon, even the shape of music players will have to change, to adapt to digital music. I have 400+ CDs and I hardly play any of them. Instead, I use my Mac which I supplement with a subwoofer. CDs' days are numbered. A new distribution and pricing scheme is in order. Or should be.
6. Free downloads allow me to try music without having to buy a full CD. If I like the music, I almost always buy the CD.
7. Studies show that people who are active in downloading free music buy many more CDs than people who don't.
8. Free music downloads are GOOD for the music industry because it gives music a much wider exposure than it would have had otherwise and this drives CD sales.
9. File sharing is just that, SHARING, it gives exposure to lesser known groups that you'd never have access to any other way. I'm a paying member of Audio Galaxy, so it's not free to me. I only make hard copies of music when my hard drive is too full. It beats trying to find a stand-alone jukebox to play my 2000 CD's.
10. I mainly download music which is either a) Unavailable in the current catalogue or b) has been recommended in some way, and I want a 'taster' of the band. A particular discovery I made this way was 'The Orb', who I'd never have heard of but for Napsters search engine. If the music industry embraced the net properly, more music would be around for us all to choose from, and we'd all be happy. I am also transcribing most of my vinyl to PC, which I intend to make available when I have the bandwidth.

11. i am not interested for the most part in downloading music from the internet. I believe in supporting the music industry through the sales of their music, and much prefer to have the original CD from the store.
12. I very rarely download MP3 files. It is illegal for a reason: music has patented rights and smuggling these rights hurts the music industry and, especially the artists themselves. The only way this could be a sustainable business for the music industry in the long run is if mega advertisers fund the music online. But 1-The benefits of Online advertising are still questionable and 2-Most importantly, this would strip artists of their artistic freedom and provide consumers with a melting pot of similar mass-produced pop music advertised by Coke and Nike. The trend has already started with Britney and Pepsi. Without advertisers, free online music is not viable.
13. the label's solution is a joke--if i'm paying for mp3, it will be a straight, burnable mp3(emusic.com)--i'm not going to waste my time with unburnable/limited burn formats (i.e. pressplay/realone even though these formats are easy to burn regardless)
14. I use mp3 files because I need to find particular music. Last summer I downloaded over 2000 music files- That was over 20 GIGS of music. After acquiring all this music, I was only able to use 3 songs. I am a dancer, and the music I was able to download is VERY unique, and fits my performance piece perfectly. Could you imagine me purchasing over 2000 songs in CDs? If each CD were to give 8 songs, that would be 250 CD's. At the current rate of \$17.99 @ Virgin Music Stores that would be \$4,497.50 plus the going tax rate here in NYC of 8.25% that's \$4,868.54!!!!!! Hardly what anyone would pay to learn about a particular subject in order to prepare to give a speech about Shakespeare.
15. I don't believe I've committed an illegal act. Neither do I believe these services should cease to exist. They are a public archive of history. Just like a library, where you can "borrow" a book, read it, absorb it, use the authors' intellectual property and not have to pay a cent to any one. If movie files were as accessible, I'd support file sharing of movies as well. Imagine acquiring Casa Blanca as easy as an MP3; or the video of Martin Luther King's famous "I have a Dream" speech. Children of all ages would have access to it... It is a public archive of our history. Times have changed. Technology is getting the better of us. I assure you, the only people bitching about MP3s are greedy, fat old men in \$2,000 suits that mistaken a palm pilot for a cell phone. There is more to file sharing than just getting the newest Ricky Martin CD. Thanks for your time
16. I am assuming that in question "How much (in US Dollars) would you be willing to pay for a YEARLY subscription to an industry supported web site, with a COMPLETE catalog of all recordings ever made?" I could not record & store what I was downloading - perhaps you need to differentiate between a stream that could be recorded vs. one that could not. I know that several record companies are marketing a streaming service, but it will be protected so as to prevent recording. This seems to make sense, as otherwise (given a broad-band connection) you could fairly easily download as much of the catalog as you wanted & cancel your service and / or sell pirated copies to others.
17. I generally don't download music and then make a CD of it, like a lot of people I know. Instead, I use filesharing to find music that I like, and then I go out and actually buy the CD. Filesharing is, for me, simply a convenient way of finding music that I might like without having to go to a store.
18. I think it is all about getting your favorite songs from an artist, not having to pay for the not so good songs, being able to make mixes, and convenience
19. Personally, the biggest threat that to MP3's is the quality of the music. MP3's lack CD quality.



20. This really isn't that hard a problem to solve, at least conceptually. Music users want two options. A - I pay a price, and I OWN the music. It's mine forever, in whatever format I like, and I can transfer it to whatever device I want. None of this "unrippable" CD crap. B - I pay a lower price, and I "rent" the music for a limited time. The file is secure and unrippable and has a built-in "self-destruct" timer, and it deletes itself when the time's up. Time can vary from 1 day (having a party and want some new tunes for stereo) to 1 yr (want to try album, probably will get bored with it).
21. CDs are to digital music as typewriters are to wordprocessing software. Digital music files make it so easy to listen to the songs you want wherever you are without carrying around bulky CDs. Ease of organizing and cataloging music is another attractive feature. My only complaints are that downloading digital files still takes too long (even with Broadband), is often unreliable, isn't completely idiot proof and presents morality issues--i.e. stealing music. I totally look forward to the day when every song ever published can be easily and reliably downloaded by going to a standardized, easy to use Web site. I also look forward to better audio file compression formats. As far as CDs are concerned I see them going the way of the 8-track within ten years.
22. Survey feedback: Be careful with how you analyze responses to this question: "On average, how many CDs do you buy every year now?" Just because someone says they'll be buying less CDs not that doesn't mean it's because they're using MP3s more. In my case I'm buying less CDs because I am out of work and have less money. The weak economy should be considered when analyzing responses.
23. Industry efforts to wipe out file sharing or enforce file formats are doomed. I will not download formats that limit my ability to play the music on different devices.
24. I think the current trends in digital music will only escalate. The industry has gouged the consumer for years anyway. The unit price of making a CD + publishing is approx. \$5 at best. Consequently, markups on CDs top 300% once units hit retail. There's a high margin business.
25. I would be even more likely to depend on digital music if I had a high-speed internet connection in my home. Right now, I download music after hours at my office, so if I had the ability to easily download and store (burn to CD) music at home, I would significantly decrease the number of CDs purchased annually.
26. I only use MP3's to check out material i can't find elsewhere... I am very against the way mp3's are used, and don't believe there is a difference between downloading mp3's of an album and burning them or stealing the CD from a record store... i also have a terrible CD addiction
27. MP3 is simply a very compact and convenient format for music storage. Great! I hope broadband development will allow more artists to "disintermediate" the music business distribution channels. For example, you can go to a band's site and (for a fee) download lots of content (sounds and videos from jam-sessions, for example). Even the concept of albums might become out dated.
28. Very few albums have more than a couple of good songs. In effect, I end up paying all that money for 2 songs. I rather download the two. Also, in countries like India, most albums are never released, so there is no other alternative. Even when it is available, pricing is not based on purchasing power parity. How can an India, other developing country users afford to buy CDs for \$10-\$13. Even for young executives, 1CD is 3% of his take home, compare this with the US/European purchasing power.

29. I think the recording industry has been GOUGING the public for decades. If they could only be a "little" fairer on their end user prices, I would buy more CD's. I strongly feel that the artists are not getting their fair share, but in fact the Labels are getting fatter by the day. As I see it, the Labels are starting to feel the bite from MP3 technology and need to be careful in their next move because the music buying public will be watching and will take whatever action they deem necessary, which could mean putting them out of business or near it.
30. Listening to pieces of music online, especially of a new artist, actually encourages me to purchase music by that person or group. I will never again pay 12 to 20 dollars on a "blind shot"(new artist) as I did when music was on vinyl for 5 dollars. Nor will I download music from websites, because of the terrible sound.
31. The music industry, or more specifically the "Big Five", in thier ever-escalating greed for the quick dollar, have screwed themselves royally this time by both signing marginally-talented sound alike singers and bands and pissing off the people who support the industry the most. I refuse to pay for their short-sightedness.
32. To paraphrase...it's not the delivery system, "it's the product, stupid." The current big companies are killing the industry. They offer a limited choice in music and don't distribute more unusual artists. They are also buying up (and subsequently destroying) all the small labels that used to distribute more unusual artists. To top it all off they are greeding are short sighted. They rip off artists and provide little in return. Courtney Love was right. The record companies are the real music pirates.
33. I purchase albums after I have heard enough of the record to feel comfortable that I'm not wasting 20 bucks. I would buy more albums if the quality of what gets put out these days was not so bad. Most stuff I download I wouldn't have bought anyway. Record compnies would help themselves if they 1:lowered the price of CDs so you could feel comfortable taking a chance and 2:put more time into developing artists & albums so that a good single isn't followed up by 14 crappy album filler songs.
34. I usually only like 2 or 3 songs on a CD anyway, so a free MP3 version is usually best. The only downside is the quality is usually not as good.
35. Most of the crap produced today is overpriced. I download rare items, items of passing interest, or items that I want to "audition." I then buy CD's of things I really like.
36. There is no excuse for charging the outrageous prices for CD's that the industry charges. Any teenager with free software can produce a CD; it's a no-brainer. Perhaps if the industry would stop paying people like B. Spears \$80 million for junk nobody wants, and stop advertising that crap so much, they could lower the prices of CD's to a reasonable level and give people more than an LP's worth of music on a CD.
37. The music industry is greedy and monopolistic. They stifle the creativity of really talented musicians who do not fit into their preconceived "models." File sharing permits emerging groups to be heard.
38. It would be great if one could just buy a track or two online and not have to get the whole CD. Tower had a system like this, but it charged as much as \$2 for each track! Again, more than the price of a CD. This is another example of corporate greed. Target also had a very small selection, especially of classical, which I am interested in.

39. The arguments that the music industry uses today against file sharing are the same arguments that it used when home cassette recorders were introduced in the '60's: people would stop buying music because they could record "everything" from FM. Well, it didn't happen. Same with this situation. "Everything" is not available online. I defy anyone to find most classical and operatic recordings online. The popular stuff is available, not "everything." People will still continue to buy CD's, or at least buy music, but I think the method of distribution is changing. I see digital delivery of purchased music as the wave of the future.
40. MP3's are the next generation in music storage. They're quick, convenient, easily stored, and can't be scratched or lost like CD's. Music companies need to see the writing on the wall.
41. The RIAA, MPAA and other media cos. with mountains of money sufficient to buy off the politicians are so busy suing every P2P that the question of the technology itself is in jeopardy. These cos. are beyond greedy. They care nothing for consumer interests or fair rights usage of recorded media. Their main emphasis is on protecting the status quo of their control of the distribution channels of music and other recorded media and otherwise shoving no talent bubblegum acts like Brittniee and BackStreet Boys down the throats of consumers. In short, they would rather pay off a politician to pass a law to outlaw all technology than rewrite their business plan to adapt and survive in an information society. As long as greedy corporate players like the RIAA and MPAA continue to line the pockets of the clueless 900 year old politicians currently passing laws to outlaw technology such as P2P and ridiculous legislation such as the DMCA, I will never buy another CD or DVD ever again. Take it to heart MBA boy, it won't be long before \*you're\* in the driver's seat of one of these greedy corporate player companies. The common people who buy the CDs/DVDs/etc. will not continue to stand for the manner in which RIAA, MPAA and others like them buy off politicians to protect their ancient business plans and hide behind "but it's only for the artists" obvious ploy.
42. There will have to be some serious intervention by the federal government to slow down file sharing. Right now, as soon as a service is taken down, another one pops up to replace it. No one in America will ever pay for something when they can get it for free, and more conveniently. Especially when most people don't see sharing MP3s as "stealing" and don't have any moral issues with it.
43. I live in the US and of course I can never find music from Brazil here, I already listen to the radio from back home on the internet. I was able to find a rare really rare brazilian song on napster and I could never find this music in ANY music store in Brazil, needless to say all music should be online, including from the past... so I don't have to buy CD from back home and have them shipped here = pricey!
44. I'd pay a couple cents per down load. maybe even a 1-2 bucks per download. That might be a better format than a flat yearly fee (because people get addicted and don't realize how much they are spending until it's too late!). CD's and tapes and records are just inconvenient. but i'd pay for music in digital format. I love my ipod!
45. I did participate in the survey and typed in a few comments as well. Let me just elaborate here. No, the music industry is not doomed (as the guy above smartly pointed out) but the incumbent music distribution channel is. As an avid user of digital music myself, I definitely see a day when music CDs will no longer exist. It may be a long way off, but it will happen. I don't even think music sharing over P2P has matured yet, and for that, the music industry has the late arrival of broadband to thank. Once broadband becomes the standard, universal Internet connection (and it will, inevitably) you can expect file sharing numbers to just go haywire. CDs, SACDs, MDs, and other what-have-yous - I think they are doomed because the way people listen to music is itself

changing. I, for example, have 400+ CDs gathering mold in my living room because I haven't played them in ages. Instead it's my Mac with subwoofer that booms, and it's far more fun to use than fiddling with a stereo, because of great software like SoundJam (iTunes needs some more work). When I step out of the house, it's my iPod in my pocket, not my portable CD player in my backpack. I can imagine a day when stereos with CD players have become museum pieces, because digital-music playing stereos have taken over the living room. (Actually, HMV here in Hong Kong sold something like this for about US\$500, made by a Chinese brand, but it had only 20 gigabytes, or even less.) Will there be a dominant commercial model? There has to be. I hate to sound like Forrester, but I think record shops will be a sunset industry, because of the convenience of downloading licensed music from record companies', or even artists' websites. I'm sure record companies know that people who share music files in P2P channels aren't just doing it because it's free, but because it's convenient. If record companies build a fast and easy-to-use distribution system, put up an impressive repertoire, allow full-song streaming, and top it with an easily understandable pricing structure, buyers will come. Record companies just have to cooperate on this. If they don't, the loss is all theirs.

46. Have never actually used file sharing systems before -- have stolen files from other people who downloaded though. Generally prefer to buy CD's.
47. CDs are generally preferred but due to the price of albums it's just not possible to get the amount of music you want and that's where the internet and free downloads come in but really i prefer the whole package of an album with inlay etc.
48. I download simply because 99% of the songs I take are ones that I would never buy the album for anyways. I am not going to pay \$20 just to get one song from some one-hit wonder. I still buy the albums of bands that I love.
49. I use these services only for convenience to find rare songs or clips of songs that I need on short notice or for one time use.
50. Record labels have always totally ripped-off artists in the past. Now they're upset that they are missing out on revenue maybe? - how hypocritical. Please do not use this information to help record labels in any way.
51. I'm not a big music person..I like downloading music so I can have a bunch of music I like from various artists all on one CD...I really only listen to music in the car (I only drive when I rent a car for long trips), at the gym and at home before I go out on weekends (entertaining friends)
52. If Artists received more of the money from their work I might feel worse about stealing the music, but I feel no guilt in taking money from a monstrous label that has exploited artists for years and is now whining that they should be protected from exploitation.
53. To be frank, the amount of money I spent on music was so small, that the "lost" revenue that my newfound use of "free" music was hardly measurable. While I now download between 3-10 songs a day- most of them I listen to once and delete or I already own a commercial copy of the recording stored in a way that does not make it possible to listen to on my computer. While the internet is obviously useful for selling/distributing new music My greatest concern is for older artists (like Ringo Starr) who are starving to death while the music they made is being shared by new fans. There must be a way to compensate these stars of yesteryear who truly need the money. To quote Kid Rock- I already have 20 million, why do I need 30?

54. history will record the record industry's botched handling of the mp3 phenomenon as one of the largest strategic business snafu's in modern history. their collective arrogance, ignorance and greed was, and continues to be, astounding. at best, people want to buy one song in mp3 format at a time for about a quarter or so. even the most casual of music fans will tell you that 80% of the music currently in release is artistically dubious filler. the solution lies in providing the consumer with a cheap and effective way to sample and purchase only the songs they (the consumer) deem to be worthy. a song by song mp3-based purchasing system allows the consumer to cost effectively build a very strong catalog of recordings. with this system a consumer can choose to ultimately purchase or download cd's of the artists that they enjoy in their entirety or are willing to explore and learn more about. the days of the recording industry charging 16 to 20 dollars for a cd with only three passible songs on it are rapidly coming to a conclusion. unfortunately the recording industry gouged consumers and hurt artists for far too many years. as a result, i'm afraid the public has very little sympathy left for the troubled business situation they now find themselves in. thank you for the opportunity to comment.
55. a lot of the music i have downloaded is from pretty old movies, like from 70's and so the soundtracks just aren't available anymore. also, the convenience of having more than 12 cd's in your car (i have a 20gb player) is something you can't really let go of. as far as the current trends go, the music industries' refusal to let go of the older and in their opinion more profitable model will really hurt them in the long. it seems those people think that just because they made profit using that system before, they are legally guaranteed to do so forever even in the face of sweeping technological changes. advances in technology won't discriminate against any company or government. the RIAA members' hold over the generation which "serves" the public in governmental positions has allowed them to stall the advances in digital music distribution. who is going to save them when the mp3 generation comes to power?
56. I wish they'd just charge a per song fee of, say, 50 cents a song. It should certainly not cost more to download individual songs to make a CD than to buy the CD -- these services that let you download songs for \$3 each (CDNOW) are ridiculous!
57. The music industry is composed of a bunch of greedy slimeballs that don't care about the artist or the consumer.
58. Current trends: price and availability, Use MP3 for price and comfort, I purchase only my very favourite artists
59. Feedback: the market transaction unit will be the song, not the album. Think of the implications.
60. CDs must be much cheaper around 8\$
61. in my opinion, file sharing, downloading music and assembling cds on copyrighted material is unethical.....period. i totally understand the music industry's shortcomings, however, 2 wrongs don't make a right. society needs to re-educate itself on respect. it goes farther than that.....at least its a start.....or else all forms of life will eventually stop.
62. commercial CD's are too expensive, generally contain only one or two good songs, and thus offer too little value
63. As time goes by, I am downloading more music from the Internet. But I will still buy CDs from artists I really like -- some of which I have discovered via file-shared MP3s. For example, I might hear a song on a TV show or commercial, and look for it on the Internet. If I can find other songs by the same artist, I'll download those, too, and may buy the CD if I really like them.

64. As an aspiring singer-songwriter, I've long believed that record companies are the real thieves in the music industry. It would be nice to see the industry take advantage of the digital medium and provide music purchasing options like mp3.com does.
65. I download, I listen and if I like I buy the cd if it's available. I love to read the liner notes and the overall package that has been put together to accompany the cd. I also download artists that allow taping and trading of those live shows...John Mayer, Glen Phillips, etc.
66. I actually don't look for new music often, so the prices I'm willing to pay for a complete or label catalog are low. Also, without the overhead of a store (rent, cashiers, shipping, salaries of the folk at the distributors, etc), the cost of a CDs worth of music is pretty small. The RIAA would probably like to setup a \$20 per CD online download site, but nobody will go for that. Nobody will go for pay per play either. If I enjoy a song I could end up paying a fortune for it. If it's a good song, lots of people will buy it, and the artist will be rewarded in that way.
67. The prices of CDs are ever increasing while the cost to produce CDs are negligible. On top of that, the artists see very little of this money. Some bands, like Fugazi, state on their CD case "If you are paying more than \$8.99 for this CD you are being ripped off. Order directly from us at - mailing address-".
68. A drop in prices would more accurately reflect what a CD is worth, encourage people to buy more CDs, and experiment with new artists. Lesser known artists currently struggle, and a lower CD price would probably go a long way to helping newer artists acquire a fan base.
69. While the options you list for things that would encourage me to buy CDs would be neat bonuses, I buy a CD for the music. None of your choices would encourage me to buy more CDs.
70. I almost never use my CD player these days. I play CDs in my computer. The new trend in copy-protected and non-computer playable CDs may cause me to abandon purchasing CDs at all. There's no point in buying a plastic disc I can't use.
71. Also the digital rights management stuff people are trying to introduce would also be a pain. We are legally allowed to copy and/or move music for our own use. If people have to buy a copy of a song for work, another for home, another for the car, another for the walkman/discman/mp3player, etc, they're just going to get annoyed. The RIAA doesn't care, because it's not like people are going to give up on music. This attitude could be considered misuse of monopoly power. Even if you don't make them pay again, but they have to go through an authorization process, it's going to be too much hassle. It'll be like the early home computer days when the copy protection was so annoying that people who bought games would seek out the cracked copies anyway just to not have to deal with it. Eventually the software houses got it, lets hope Jack Valenti isn't as dumb as he seems.
72. All of the MP3s I have are either: 1) from MP3.com or otherwise free 2) A band someone recommended and I'm not going to pay to check them out 3) From a CD someone borrowed and never returned.
73. You may want to include more specific time-based information, particularly in light of the recent recession the US and Canada has been struck with. For example, I can say that my amount of file sharing nearly tripled when I lost my job, since the amount of disposable income I could allocate to music dropped considerably.

74. I feel there is too much emphasis on "free" nature of internet downloads. I can now quickly and easily find and DL any song I want. Also much more convenient than a huge drawer full of CDs!
75. I like to download mp3 music because the net is often the only place I can find rare songs. Besides that, if I download some music that I enjoy, I am prone to buy them.
76. Napster was all about convenience. 50% of the music I downloaded I already owned - I just didn't have my albums at work, where I wanted to listen to them. 20% were unreleased things I couldn't buy at any price. 20% were things I wouldn't buy - theme songs, jokes, entries in impromptu "worst song" contests! The other 10%? Stuff I was evaluating, especially in areas I wasn't familiar with. I never would have guessed how much I like Dar Williams and (to my total surprise) Eminem if I hadn't been able to find their music on Napster. I'm a customer now, whereas I wouldn't have been. I'd be happy to pay \$0.25/download if Napster still existed as it did. Note: much/most of the music I download is legal - Grateful Dead, Phish, Dave Matthews band concerts, etc.
77. Compilation, the good stuff on one CD, a personal memory of tunes I like on a single CD. I listen to music, it's not my life.
78. Most of the music I download I already own in my personal collection of records, tapes or CD's. It's just more convenient to download MP3 rather than convert my existing (paid for!) collection. Good luck with the survey!
79. Here's the thing--- if you're looking for mainstream stuff.. it's all available on-line.. but God forbid if you're into some not-so-mainstream music - then the availability falls far short of what would be needed to make this commercially viable for me.. example - 90% of my music is Indian Classical Music (ICM) - of all the ICM ever produced, I would venture to guess only about 10% is available online currently - and thus is not an appealing choice to me.
80. I haven't seen anything worth purchase in the past 10 years. For this reason, most of what I desire is out of print and only available through file sharing, bootleg or mail list distribution. I have a music collection ranging from 60s through 80s resulting from years in the retail end of the music industry. I don't see anything coming out recently that is worth owning, and fear the era of originality in music is far since gone. Many folks have gone back to collecting vinyl. If a label re-released an extensive collection of pre 1985 era music, aimed at maturing baby-boomers; they could "re-start" the music industry and recoup market share. The society as a whole is seeking memories of the "feel-good" era; the time before 1972 when we reached the pinnacle of affluence and sight of the American Dream grew dimmer and dimmer with each passing year. The "baby-boomers" may well be the last generation to support and preserve the music industry as we know it. I don't look for any savior unless a series of groups with a "new" vision of rock (such as Boston) emerge and jump start the rock industry.
81. if it's illegal, i think i can live without it. i tend to download songs i already own and just want on my pc, or new songs which i then delete after 24 hrs.
82. Digital sharing has only opened my eyes to new artists, and HELPED to get artists I feel deeply about sold. All this mumbo jumbo about hurting cd sales is moronic. Hey, here's an idea...make good music, I'll sample it with mp3's, and I'll buy the album. Hell I might even buy 2 or 3 of the same album. If it's bad I will download and say, "damn, I'm glad I didn't buy that piece of crap" good music = \$\$\$ bad music = artist go get a job at Wendy's The listeners will be the judge ultimately. That's just me though, I support the artists I like.

83. This issues tears me up a little. I love digital music for its convenience, but mostly for discovering new bands (this wasn't in your choice list, but checking out a band's record is by far the first). When I hear a single I like on the radio or hear about a band from a friend or the media, file sharing sites is a perfect way to check out their complete work. However, I really believe in supporting bands I like and am a CD collector, so I buy copies of CDs that sound good on the web.
84. With respect to the survey, the option that is most likely to make me buy more CDs is lowered cost (which is not investigated in the question). However, I doubt I will ever completely renounce file-sharing - although the proportion of music obtained that way would be reduced via lowered CD costs. With respect to digital trends, the success of Kaza and P2P sharing software is unlikely to be halted, or even plateau. The recording industry must undergo a paradigm shift and attempt to compete with the concept of free & convenient music tracks. More cover art is not the answer. Convenience of purchase is: a comprehensive subscription service, lower CD costs, less filler tracks, lower artist compensation, etc. It's difficult to feel sorry for Ulrich (Metallica) and other millionaires while they complain about lost revenue and nebulous artistic 'loss of control' of their music. Tell that to Gerschwin and Mozart.
85. Having been buying since the 60's, I have records, open reels, tapes and 8-tracks. A lot of my music I download is simply to bring these old formats up to MP3. I appreciate that musicians have to eat and therefore do still purchase!! Unfortunately Records companies are also greedy!!
86. "high" CD prices are not the reason I have quit buying CDs; I have quit buying CDs because nothing is cheaper than free, and file-sharing is free. I feel pretty guilty about it, but it is hard to resist. Part of me wishes the artists would shut these services down.
87. I love downloading MP3s, but I have never burned them on to a CD to listen to off my computer. I still buy CDs if I want a particular artist's work or a compilation, but I mostly like individual songs, or decades of songs, rather than specific groups. That's the main reason I download my music - to broaden my collection of specific songs, not artists.
88. Record companies do it to themselves. How many greatest hits can a band have? Then the trick of putting one or two new songs with a bunch of already released stuff so you have to pay full price for a bunch of songs you already have just to get the "new ones" almost justifies the download situation.
89. I use MP3's for convenience. Download services like Morpheus and Napster let me try out music without having to go to HMV etc. and use filthy headphones, be limited to the store selection and have to stand like a dork for 45 minutes to try and figure out which songs I like. The RIAA and the big labels are going to either disappear or be substantially more consumer-friendly in the future. As a result, music's going to be (hopefully) cheaper to buy than it is now. I'm \*not\* going to pay \$25+ Cdn for a new release, but I will pay \$15-18 for one. Overcharge me and I guarantee I will spend a week at 56K downloading every track on the overpriced album. If the price of a CD is under my nuisance limit (<\$10 Cdn) then it's buying time for me.
90. If you can figure out how to come up with a pay model for digital music online, you'll be the next Bill Gates



# Appendix B: Recording Industry Sales

The Recording Industry Association of America's

## 2000 Yearend Statistics

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**Manufacturers' Unit Shipments and Dollar Value**  
(In Millions, net after returns)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	% CHANGE 1998-1999	2000	% CHANGE 1999-2000
<b>CD</b>	333.3 4,337.7	407.5 5,326.5	495.4 6,511.4	662.1 8,464.5	722.9 9,377.4	778.9 9,934.7	753.1 9,915.1	847.0 11,416.0	938.9 12,816.3	10.8% 12.3%	942.5 13,214.5	0.4% 3.1%
<b>CD Single</b>	5.7 35.1	7.3 45.1	7.8 45.8	9.3 56.1	21.5 110.9	43.2 184.1	66.7 272.7	56.0 213.2	55.9 222.4	-0.1% 4.3%	34.2 142.7	-38.8% -35.8%
<b>Cassette</b>	360.1 3,019.6	366.4 3,116.3	339.5 2,915.8	345.4 2,976.4	272.6 2,303.6	225.3 1,905.3	172.6 1,522.7	158.5 1,419.9	123.6 1,061.6	-22.0% -25.2%	76.0 626.0	-38.5% -41.0%
<b>Cassette Single</b>	69.0 230.4	84.6 298.8	85.6 298.5	81.1 274.9	70.7 236.3	59.9 189.3	42.2 133.5	26.4 94.4	14.2 48.0	-46.0% -49.2%	1.3 4.6	-91.0% -90.3%
<b>LP/EP</b>	4.8 29.4	2.3 13.5	1.2 10.6	1.9 17.8	2.2 25.1	2.9 36.8	2.7 33.3	3.4 34.0	2.9 31.8	-14.0% -6.7%	2.2 27.7	-24.6% -12.7%
<b>Vinyl Single</b>	22.0 63.9	19.8 66.4	15.1 51.2	11.7 47.2	10.2 46.7	10.1 47.5	7.5 35.6	5.4 25.7	5.3 27.9	-2.5% 8.4%	4.8 26.3	-8.1% -5.4%
<b>Music Video</b>	6.1 118.1	7.6 157.4	11.0 213.3	11.2 231.1	12.6 250.3	16.9 236.1	18.6 323.9	27.2 506.0	19.8 376.7	-28.3% -27.6%	18.2 281.9	-8.0% -25.2%
<b>*DVD</b>	-	-	-	-	-	-	-	0.5 12.2	2.5 66.3	405% 442%	3.3 80.3	35.2% 21.1%
<b>Total Units</b>	<b>801.0</b>	<b>895.5</b>	<b>955.6</b>	<b>1,122.7</b>	<b>1,112.7</b>	<b>1,137.2</b>	<b>1,063.4</b>	<b>1,124.3</b>	<b>1,160.6</b>	<b>3.2%</b>	<b>1,079.3</b>	<b>-7.0%</b>
<b>Total Value</b>	<b>7,834.2</b>	<b>9,024.0</b>	<b>10,046.6</b>	<b>12,068.0</b>	<b>12,320.3</b>	<b>12,533.8</b>	<b>12,236.8</b>	<b>13,723.5</b>	<b>14,584.5</b>	<b>6.3%</b>	<b>14,323.0</b>	<b>-1.8%</b>
<b>Total Retail Units</b>							<b>817.5</b>	<b>850.0</b>	<b>869.7</b>	<b>2.3%</b>	<b>788.6</b>	<b>-9.3%</b>
<b>Total Retail Value</b>							<b>10,785.8</b>	<b>12,165.4</b>	<b>13,048.0</b>	<b>7.3%</b>	<b>12,705.0</b>	<b>-2.6%</b>

\*While broken out for this chart, DVD Audio Product is included in the Music Video totals

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