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THE IMPACT OF ON-LINE MUSIC TRADING

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By

Timothy J. Coffey

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Alexander E. Emanuel, Advisor

ABSTRACT

The advent of the mp3 (MPEG Audio Layer III) codec, high bandwidth Internet services, and Peer-To-Peer (P2P) networks have made the unauthorized distribution of copyrighted music more wide spread than it was prior to the development of the mp3. The legal proceedings of RIAA vs. Napster and the threat of lawsuits against individuals engaging in pirating have not slowed the frequency of violations. This report explores possible solutions to this problem.

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CHAPTER 1: INTRODUCTION

Since the invention of the phonograph in 1877, prerecorded music has steadily become a prevalent part of our every day lives. As the technology evolves, improves, and becomes more affordable and portable, we can enjoy listening to our favorite artists and songs in virtually any setting. Home duplication of prerecorded music has been achievable for nearly 40 years. It was not usual for high school students in 1985, for example, to come home from school and place a fresh, blank audio cassette into their cassette decks, put on a friend's new 33 RPM, 16 inch vinyl long play (LP) album, and make a recording of it. If the students were fortunate, they could put that cassette in a Sony Walkman and listen to it through headphones as they walked home. As analog vinyl gave way digital compact discs, people were able to enjoy high-fidelity recordings of their favorite songs at increasingly affordable prices. We can listen to CD's in the car if we have a car stereo with a CD player or changer mounted in the trunk. We can listen to CD's on our personal computers, or on the latest variant of the Walkman. Or, we can stay at home, turn on the stereo, and listen to our songs in our living room.

The compact disc is the current gold standard of digital audio, offering a clarity and crispness that was unimaginable in 1877 when Thomas Edison invented the phonograph. A CD can be played an infinite amount of times without loss of sound quality, unlike Edison's tin foil cylinders, the LP or a prerecorded cassette, which wear out over time and suffer loss of fidelity as a result. An equally important format of digital audio is the mp3 format, which, using the principles of psychoacoustics, reduces a standard digital audio track from a CD to one tenth of its original size while suffering no discernable loss in fidelity. Third party software, such as CD X-Tractor, is available on the Internet free of charge to convert an audio track off a CD to an mp3, and to "rip" a full length CD is usually a manner of minutes, depending on the selected resolution of the mp3. Unfortunately, with the advent of the mp3, music pirating would become easier than ever.

Pirating in the music business is nothing new. Artists such as Bob Dylan, The Beatles and Led Zeppelin all endured the illegal recordings of their live shows. United States copyright laws prohibit unauthorized reproduction of a song or album, and these recordings were unauthorized. Often times, recording equipment would be confiscated at

concert halls and the offender would be thrown out of the building with their equipment smashed to pieces. Other times, wheelchair-bound concertgoers would sneak recording equipment in with them and get recordings. Mike Millard, a paraplegic from Southern California, recorded several legendary Zeppelin concerts using that technique. Zeppelin guitarist Jimmy Page eventually came to take a long view that Zeppelin "bootlegs", even if they were of questionable fidelity, cemented his band's legacy as one of the greatest acts to ever tread the boards on stages all over the world. Since Page and the other members of Zeppelin were already millionaires a hundred times over, he grew not to care about pirate recordings of his band, and would often purchase these recordings to see how well his band played on any given night.

However, Zeppelin and its contemporaries had their glory days in the pre-digital era. Piracy was an annoyance during their reign and did not damage the bottom line of recording industry in any appreciable way. In 1999, however, the music industry was forever altered by the advent of Napster. The Napster source code was able to network personal computers across the world and enable owners to swap music files (mp3's) at rates orders of magnitude greater than before. Each duplicate copy of any given song is a violation of copyright laws and represents a loss of money for not just the performers, songwriters and record label, but the whole infrastructure of the industry that includes recording technicians and marketing/public-relations personnel. What was an annoyance to the industry was now a full-blown epidemic, and the organization that represents the recording industry in the United States, the Recording Industry Association of America, was forced to respond with lawsuits against not just Napster but individuals who were caught downloading and swapping pirated copies of songs.

Would Jimmy Page be so cavalier about this issue if Led Zeppelin's reign was in the 1990's instead of the 1970's? Page has no comments on the record, but the Zeppelin of its era, the heavy metal band Metallica, certainly made its position on the issue clear by filing suit against Napster shortly after the RIAA did the same. "With each project, we go through a grueling creative process to achieve music that we feel is representative of Metallica at that very moment in our lives," said Metallica drummer Lars Ulrich in 2000. "We take our craft -- whether it be the music, the lyrics, or the photos and artwork -- very seriously, as do most artists. It is therefore sickening to know that our art is being

traded like a commodity rather than the art that it is. From a business standpoint, this is about piracy -- taking something that doesn't belong to you; and that is morally and legally wrong. The trading of such information -- whether it's music, videos, photos, or whatever -- is, in effect, trafficking in stolen goods."

Metallica's position on Napster and similar Internet services was representative of the music community, with diverse artists such as Sir Paul McCartney, Elton John, Britney Spears, and Dr. Dre also taking public anti-Napster positions. In 2005, music piracy is still an issue, and according to the IFPI, the primary culprit is illegal downloads off the Internet. The crux of the issue is seemingly unrelated but congruent technological advances in computing power, high-speed Internet connections and high-fidelity audio recordings merging at precisely the right moment to catch the RIAA ill-prepared to address the issue.

What can be done, if anything, to solve or alleviate the problem? This paper will explore that issue. We will look at the genesis of modern day copyright laws in the United States and how they have evolved to protect the intellectual and creative property of musical artists. We will also look at how audio recording technology has advanced since the days of Edison, from the earliest phonographs, to the gramophone, the cassette player, and the compact disc player. The origins of Napster and how it works will be explained, as well as a brief economic discussion that examines possible external factors that may affect the sales of the record industry. Finally, we will propose options, both short and long-term, that may help prevent piracy in the future.

CHAPTER 2: A BRIEF COPYRIGHT LAW PRIMER

It is beneficial to examine the history and basis of copyright law in the United States. Before there were audio and musical recordings to protect via ownership, it was the Bible itself that changed how ownership of intellectual property was administered. The discussion will be limited to key and pertinent features of copyright law vis-à-vis Napster and the consequential rulings.

The Gutenberg Bible and The Stationers' Company

The origins of modern copyright law predate the founding of this country by over 300 years. Johannes Gutenberg (c1400-1468) is widely credited as the first European to print with hand-set type cast in molds. His experiments with these techniques culminated with the printing of the large Latin Bible that bears his name in 1456. Prior to Gutenberg's invention, manuscripts were copied by hand; with his invention, copying became much faster, and as the flow of information and ideas across Europe became easier, the Renaissance was born. His invention had consequences, however. As the technology invaded the British Isles, the clergy, in order to maintain its monopoly on "idea dissemination", felt it best that Gutenberg's invention was subjugated.

By the end of the fifteenth century, the number of printing presses in England increased to a point where printers were granted a near monopoly on publishing in order to control book publication. In 1662, the Licensing Act created a register of licensed books to be administered by the Stationers' Company. The 1662 Act also gave the Company the power to censor publications, but by 1695, the act expired and censorship was eased. The 1710 Parliament enacted the Statute of Anne, which addressed the concerns of English booksellers and printers. This act established a fixed term of protection of copyrighted works: fourteen years and renewable for fourteen more years if the author was alive when the first term expired. The act also prevented booksellers from forming a monopoly, and established a "public" domain by limiting the terms of the copyright. By creating a copyright statute, the basic framework of how modern musical artists collect their royalties was now in place: the author (or songwriter) would have to assign his work (song) to a publisher in order to get paid.

United States Copyright Law

The backbone of U.S. copyright law is found in Article I, Section 8, Clause 8 of the U.S. Constitution of 1787, which states "the Congress shall have power...to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries". Since the original article in 1787, several revisions have been authored. In 1831, the term of protection of copyrighted works was extended from fourteen years with the possibility to renew for another fourteen years (similar to the 1710 Statute of Anne) to 28 years with the possibility to renew for another fourteen years.[1] A major revision of the Copyright Act occurred in 1909. The scope of the act was broadened to include all works of authorship, and the term of protection was extended to have a renewal of 28 years.[2]

The current copyright laws are listed in Title 17 of the U.S. Code, and the duration of protection for registered work is summarized as follows:

- Works created after 1/1/1978 - life of the longest surviving author plus 70 years - earliest possible public domain date is 1/1/2048
- Works registered before 1/1/1978 - 95 years from the date copyright was secured.
- Works registered before 1/1/1923 - Copyright protection for 75 years has expired and these works are in the public domain.[3]

Representative Sonny Bono (D, California) introduced legislation that was signed into law on October 27, 1998 that extended copyright protection to works published prior to January 1, 1978 from 75 years to 95 years, but works prior to January 1, 1923 were still considered to be in the public domain. If we narrow the scope of published works to musical compositions under copyright protection, the following guidelines apply to the use of any registered composition:

- One cannot reproduce the music or lyrics of the composition in question
- One cannot distribute the music or lyrics either for free, for no profit, or for profit
- One cannot perform the music or lyrics in public
- One cannot play a recording of the music or lyrics in public -- even if one own the recording
- One cannot make a derivative work or arrangement for public use in any form[4]

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[1] http://www.arl.org/info/frn/copy/timeline.html#Bib

[2] Ibid

[3] Ibid

The first two bullets are of significance because in the RIAA vs. Napster ruling, which we will discuss in later chapters, Napster was found to have facilitated copyright infringement by its users. Napster was not in possession of the music, but its users were, and each song uploaded and downloaded by a Napster user was a violation of copyright law. The third bullet is applicable to cover bands. In order to for such a band to play another band's music, the ownership of the facility where the band is playing has to own the appropriate licenses. The cover band is not responsible for acquiring the licenses.

In 1999, Congress approved a significant hike in the minimum statutory damages for various types of copyright infringement in the Digital Theft Deterrence and Copyright Damages Improvement Act of 1999. The law increased the minimum statutory damages for infringements from $500 to $750 and increased the maximum from $20,000 to $30,000. The maximum for willful infringement increased from $100,000 to $150,000.[5] This was, perhaps, enacted in response to proliferation of mp3 files on the Internet, but this Act predates federal rulings against Napster by two years and enforces existing copyright law.

Public Domain

Documents and intellectual property that cannot be claimed or whose ownership has expired is said to be in the public domain. All documents published in the United States prior to 1923 are in the public domain. Musical compositions pre-1923, such as Mozart, may be used without permission, provided it is proven the composition is in the public domain, and songwriters may even incorporate music from such work into their own work and then copyright it as their own.

According to the website Public Domain Music, "Music recordings are protected separately from musical compositions. Virtually every sound recording in the USA is under copyright protection until 2067."[6]

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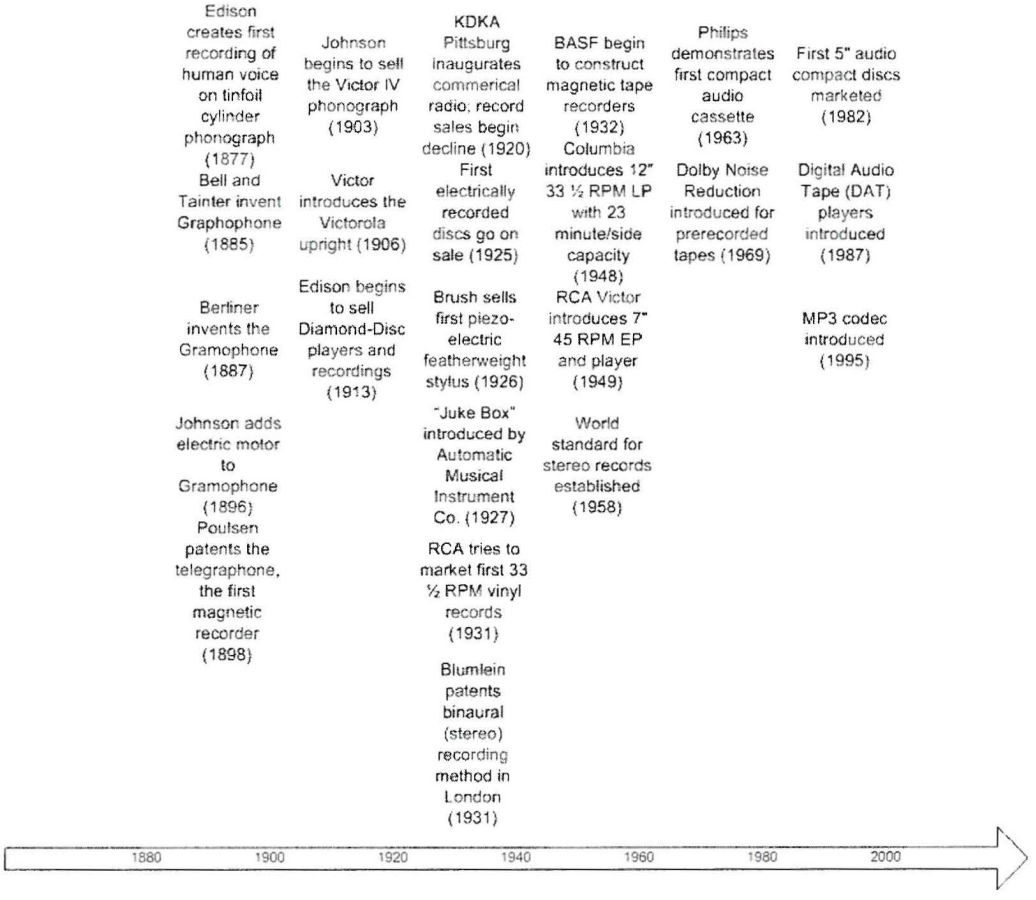
[4] Ibid
[5] Ibid
[6] http://www.pdinfo.com/

CHAPTER 3: A BRIEF HISTORY OF RECORDED MEDIA

The evolution of recordable media dates back to 1877, when Thomas Edison recorded the words "Mary Had a Little Lamb" onto his tinfoil cylinder phonograph. Figure 3.1 shows a brief timeline of the history of recording technology. While no means complete, Figure 3.1 provides a suitable picture for how the media evolved over the past 130 years. Each technological advancement has led to higher fidelity (better sound) and increased data capacity. For example, the 12 inch 33 ½ RPM vinyl long play (LP) record has a capacity of 23 minutes of data per side. Compare this to the 5 inch compact disc, which can store 74 minutes of data with superior fidelity.



A Brief Timeline of the Evolution of Recordable Media

Source: http://history.acusd.edu/gen/recording/notes.html#stereo

Figure 3.1: Brief Timeline of the Evolution of Recordable Media

It would be an exhaustive task to examine all phases of this timeline, so we now shift our focus to the digital age by examining the compact disc and the mp3 codec.

Compact Disc Timeline

Although the theory behind sampling audio dates back to 1841 when Cauchy proposed his sampling theorem, 1979 serves as a true benchmark for digital audio. Beginning in 1979, we have the following timeline:

1979

Prototype CD System demonstrated in Europe and Japan
Sony agrees to join in collaboration
Sony & Philips compromise on the standard sampling rate of a CD -- 44.1 kHz (44,100 samples per second)
Philips accepts Sony's proposal for 16-bit audio
Reed-Solomon code adopted after Sony's suggestion
Maximum playing time decided to be slightly more that 74 minutes
Disc diameter changed to 120mm to allow for 74 minutes of 16-bit stereo sound with a sample rate of 44.1 kHz

1980

Compact Disc standard proposed by Philips & Sony

1981

Matsushita accepts Compact Disc Standard
Digital Audio Disc Committee also accepts Compact Disc Standard
Sharp achieves production of semiconductor laser
Philips & Sony collaboration ends

1982

Sony & Philips both have product ready to go
Compact Disc Technology is introduced to Europe and Japan in the fall

1983

Compact Disc Technology is introduced in the United States in the spring
The Compact Disc Group formed to help market

CD-ROM Prototypes shown to public
30,000 Players sold in the U.S.
800,000 CD's sold in the U.S.

1984

Second Generation & Car CD players introduced
First Mass Replication Plant in the United States built
Portable (i.e., Sony DiscMan) CD Players sold

1985

Third generation CD Players released
CD-ROM drives hit the computer market

1986

CD-I (Interactive CD) concept created
3 Million Players sold in U.S.
53 Million CD's sold in U.S.

1987

Video CD format created
Allen Adkins of Optical Media International joins with SonoPress in Amsterdam and demonstrates a desktop system for pre-mastering CD's (Adkins and SonoPress, produced a replicated CD in less than 24-hours using this system).

1988

CD-Recordable Disc/Recorder Technology Introduced

1990

28% of all U.S. households have CD's
9.2 million players sold annually in the United States
288 million CD's sold annually in the United States
World Sales close to 1 Billion

1991

CD-I format achieved.
CD-Recordable Introduced to the Market
"QuickTopix" the first CD-R pre-mastering Software introduced by Allen Adkins

1992

CD-R Sales reach 200,000[7]

While the compact disc is quite important, perhaps the technological advancement with the most significant ramifications is the invention of the mp3 Codec.

MP3 Codec

The origins of the mp3 codec date back to 1987, when the Fraunhofer Institute began research on a high-quality, low bit-rate audio coding. The mp3 is officially known as MPEG Audio Layer III, and it represents the third standard in high quality, low bandwidth media. In 1993 MPEG-1 was introduced as a video compression standard, followed by MPEG-2 in 1994. MPEG-3, or mp3, was introduced one year later as a high quality audio compression code. The Fraunhofer Institute licenses this technology in the United States under patent 5,579,430.[8]

The basis of the mp3 is *psychoacoustics*. An article available on-line at mp3-converter.com explains the basics of the mp3:

> Uncompressed audio, such as that found on CDs, stores more data than your brain can actually process. For example, if two notes are very similar and very close together, your brain may perceive only one of them. If two sounds are very different but one is much louder than the other, your brain may never perceive the quieter signal. And of course your ears are more sensitive to some frequencies than others. The study of these auditory phenomena is called *psychoacoustics*, and quite a lot is known about the process; so much so that it can be quite accurately described in tables and charts, and in mathematical models representing human hearing patterns.
>
> MP3 encoding tools analyze incoming source signal, break it down into mathematical patterns, and compare these patterns to psychoacoustic models stored in the encoder itself. The encoder can then discard most of the data that doesn't match the stored models, keeping that which does. The person doing the encoding can specify how many bits should be allotted to storing each second of music, which in effect sets a "tolerance" level-the lower the data storage allotment, the more data will be discarded, and the worse the resulting music will sound. The process is actually quite a bit more complex than that, and we'll go into more detail later on. This kind of compression is called [_Fi_] lossy, because data is lost in the process. However, a

[7] http://www.oneoffcd.com/info/historycd.cfm

[8] http://inventors.about.com/od/mstartinventions/a/MPThree.htm

second compression run is also made, which shrinks the remaining data even more via more traditional means (similar to the familiar "zip" compression process).

MP3 files are composed of a series of very short *frames*, one after another, much like a filmstrip. Each frame of data is preceded by a *header* that contains extra information about the data to come. In some encodings, these frames may interact with one another. For example, if one frame has leftover storage space and the next frame doesn't have enough, they may team up for optimal results.

At the beginning or end of an MP3 file, extra information about the file itself, such as the name of the artist, the track title, the name of the album from which the track came, the recording year, genre, and personal comments may be stored. This is called "ID3" data, and will become increasingly useful as your collection grows.[9]

What does this mean in practice? If we were to copy the uncompressed audio of a 3 minute song off a compact disc, the file size would be on the order of 100 megabytes. If we were to encode, or "rip", the same 3 minute song with an mp3 encoder at 128 kbps, the resulting size of the mp3 would be approximately 3 megabytes. This is essentially two orders of magnitude of file size reduction, and the quality of the audio, while perhaps not as crisp as the original uncompressed version, is quite good. If we were to rip the same 3 minute song at 160 kbps or 192 kbps, the audio quality would improve without a significant amount of file size increase. To explain more technically,

Just as the movie industry has a standard that specifies the number of frames per second in a film in order to guarantee a constant rate of playback on any projector, the MP3 spec employs a similar standard. Regardless of the bit rate of the file, a frame in an MPEG-1 file lasts for 26ms (26/1000 of a second). This works out to around 38fps. If the bit rate is higher, the frame size is simply larger, and vice versa. In addition, the number of samples stored in an MP3 frame is constant, at 1,152 samples per frame.

The total size in bytes for any given frame can be calculated with the following formula: *FrameSize = 144 * BitRate / (SampleRate + Padding)*.

Where the bit rate is measured in bits per second (remember to add the relevant number of zeros to convert from kbps to bps), SampleRate refers to the samplerate of the original input data, and padding refers to extra data added to the frame to fill it up completely in the event that the encoding process leaves unfilled space in the frame. For example, if you're encoding a file at 128 kbps, the original samplerate was 44.1kHz, and

[9] http://www.mp3-converter.com/mp3codec/

no padding bit has been set, the total size of each frame will be 417.96 bytes: 144 * 128000 / (44100 + 0) = 417.96 bytes.[10]

It is because of the small file sizes that devices such as the Apple iPod are so popular. The iPod, according to technical data available at Apple's Internet site, has a storage capacity of either 30 gigabytes or 60 gigabytes. Assuming songs of 4 minute duration and encoding at 128 kbps, the iPod has a song capacity of 7,500 (30 GB) or 15,000 (60 GB) songs.[11] That is approximately 14 to 20 hours of continuous musical feedback. When we consider the original phonographs were large and the media could only store three to four minutes of data, the progress of the past 130 years is remarkable. Unfortunately, this progress has also introduced some unintended consequences.

[10] Ibid

[11] http://www.apple.com/ipod/specs.html

CHAPTER 4: NAPSTER AND THE RISE OF PEER-TO-PEER NETWORKS

With the invention of the mp3 codec, which typically encodes a CD quality song to a tenth of its original size while maintaining high audio quality, and the increasing availability of high bandwidth Internet connections, it was now feasible to share music in an expeditious manner. By January 1999, there were 150 million Internet users world wide, and half of those were in the United States.[12] The recognition of the term "mp3" jumped from less than 10 percent to over 60 percent in online polls, and Internet search engines were fielding requests for mp3 files. It was the perfect time for a college dropout to complicate the way music is shared and distributed forever.

Shawn Fanning and the Rise of Napster

Eighteen year old Shawn Fanning was frustrated by his inability to find and download music on the internet, so his solution was to stay awake for 60 hours and write source code that enabled users to share and swap music files through a centralized server. The name of his program was Napster.

"One of my college roommates loved listening to mp3s and used Internet sites such as MP3.lycos.com to find them", Fanning told the Senate Judiciary Committee in October, 2000. "He often complained about the unreliability of those sites, finding links to sites that were often dead ends, and indexes that were out of date because they were updated infrequently. I started thinking about ways to solve the reliability problems my roommate was experiencing…

"My idea was to have users list the files they were willing to share on a computer that they all could access. That list would then be updated each time a person logged on to and off of that computer. The index computer would at all times have an up-to-date list of the files people were willing to share, and the list would be voluntarily made by the users as they logged on and off the system. A user searching the index would see all the files shared by users on the network and available to others on the network at that moment.

"In contrast to traditional search engines, I envisioned a system that would be affirmatively powered by the users, who would select what information they wanted to

[12] http://www.epidemic.ws/song-swapping/EN/A%20song-swapping%20timeline.html

list on the index. Then, when the user exited the application, their portion of the list (their files) would automatically drop from the index. The index was only one part of participating in the community. I also wanted users to be able to chat with each other and share information about their favorite music, so I added these functions to the application."[13]

The basis of Napster was a network model known as Peer-To-Peer (P2P), where "each computer connected is simultaneously able to offer and request a service with parity and in a decentralized manner. In the case of P2P networks with 'file-sharing' or 'file-swapping' functions, the computers request and send files and supply services questioning the shared files." The Napster protocol itself was "a P2P protocol enabling sharing of mp3 files…the search for musical documents in the directories shared by users is carried out by a central server indexing the musical documents and addressing their transfer. The Napster central server contains only the list of songs made available by users, the real mp3 files reside only in the computers of individual users and are never transferred into the Napster server. The company says its software aims to make finding mp3 files easier on the Net."[14]

The impact of Napster was enormous. Word of mouth on the Internet spread as thousands of Internet surfers downloaded the Napster code and began sharing and swapping music files free of charge. Slashdot.com reported in November 1999, "There is a cool new tool out there called Napster that allows anyone to become a publicly accessible FTP site - tapping in to that huge resource of personal MP3 collections that everyone has, but have not been able to share... RIAA should be scared out of their minds because users are not logged on permanently, so it's hard to track them down to take legal action."[15] More to the point was the idea that "…there's a thing they call -MP3-. It means: free music! You get it on Internet in a place called Napster!"[16] Fanning testified by October 2000, the Napster community had grown to thirty two million members and

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[13] http://judiciary.senate.gov/oldsite/1092000_sf.htm

[14] http://www.epidemic.ws/song-swapping/EN/A%20song-swapping%20timeline.html

[15] Ibid
[16] Ibid

during the four months before his testimony, Napster was gaining one million new users per week.

In the abstract, Fanning's code accomplished the same thing as one friend recording a vinyl album onto a 90-minute cassette for another friend. But instead of taking 45 minutes to record the content of the album onto a cassette, it was now possible for thousands of people to download the same album in a matter of minutes. One immediate consequence of Napster was the greater the demand for an album or a song, the greater the supply because any user downloading one song would be supplying that same file for another user looking for the same song. This was reproduction on an unprecedented scale, and by December 1999, the RIAA took action and sued Napster for tributary copyright infringement.

The Record Industry Association of America

The Recording Industry Association of America (RIAA) (www.riaa.org) is the trade group that represents the U.S. recording industry, and its mission, stated on its website, is "to foster a business and legal climate that supports and promotes our members' creative and financial vitality." Towards this end, the RIAA "works to protect intellectual property rights worldwide and the First Amendment rights of artists; conduct consumer industry and technical research; and monitor and review -- state and federal laws, regulations and policies." Ninety percent of American record labels are members of the RIAA.[17]

The RIAA's website features a detailed "frequently asked questions" (FAQ) pertaining to downloading music off the Internet. One such question is "What can happen to me if I am caught infringing a copyright law?" The answer is unequivocal:

> If found guilty of copyright infringement, federal law provides for civil remedies that may include substantial monetary damages and liability for attorney fees incurred in bringing an action. Criminal penalties may be imposed if someone willfully infringes a copyrighted work, even if no profit is derived from the activity. *Thus, people who barter, trade or even give away copies of infringing works may still be criminally liable and subject to prosecution.*

[17] http://www.riaa.com

The No Electronic Theft (NET) Act specifically outlaws this activity on the Internet. Criminal penalties for copyright infringement include up to six years imprisonment, up to $250,000 in fines, or both. Students may also be subject to disciplinary action at their school, by the school's own faculty, if it is determined that school computer policies have been violated.[18]

Another FAQ is "Does uploading music on the Internet hurt anybody? Isn't it promotion for the artist?" Again, the RIAA is unequivocal with its position and uses statistics to make its point:

When you post digital music files on the Internet for anyone to take and keep, it's not promotion but distribution. It's up to the artist and copyright owner to decide how their music will be heard, distributed and promoted. Though most people do not realize it, only about 15 percent of all releases sell enough copies to make a profit and those record sales support the other 85%, including those from new and emerging artists. When someone decides to take distribution into his or her own hands, that decision can impact not only the artist whose music is being taken, but the artists that may have been supported by those sales. It's also important to remember that sales of recordings don't just support the musical artist. *Piracy cheats producers, composers, sound engineers, studio musicians, publishers and vocalists out of their share of royalties on which they generally depend for their livelihoods.*[19]

Public awareness of the RIAA and its power came into open prominence in when it filed suit against Napster in December 1999.

RIAA vs. Napster

One of the fundamental principles of copyright law pertaining to music is reproduction of a musical composition is prohibited, even if it is not for profit. People who downloaded the Napster source code to swap music files were violating that principle each time they downloaded a song and provided songs for download. The RIAA FAQ states uploading or downloading songs to and from the Internet is a copyright violation: "It is a violation if you upload or download full-length sound recordings without permission of the copyright owners. You should assume other people's works are copyrighted and can't be copied unless you know otherwise." The RIAA, faced with the prospect of musical artists and copyright owners losing millions of dollars, fired the

[18] Ibid
[19] Ibid

initial shot across Napster's bow with this statement from Cary Sherman, senior executive vice president and general counsel for RIAA: "We love the idea of using technology to build artist communities, but that's not what Napster is all about. Napster is about facilitating piracy, and trying to build a business on the backs of artists and copyright owners." Thus, the RIAA sued Napster in December 1999 for contributing to and facilitating Napster users copyright infringement.

Napster's position was because the actual music files were not in their possession and the files were being transferred from user to user, Napster was not acting illegally. "Napster does not post, host, or serve mp3 files", said Fanning. "The Napster software allows users to connect with each other, in order that they may share MP3 files stored on their individual hard drives. The number of song files available at any given time depends on the number of song files that active users choose to share from their hard drives. Users need not share any or all of their files -- they can choose which ones to make available to others. mp3 files do not pass through a centralized server. The transfer is directly from computer to computer, known as 'peer to peer.' The 'peer to peer' or decentralized nature of the technology means that the users, and only the users, determine what is shared."[20]

Metallica vs. Napster and Subsequent Court Rulings

In April of 2000, Metallica, whose record label Elektra is represented by the RIAA, sued Napster and demanded $100 for each Metallica song indexed on Napster, and also demanded Napster to block users from their songs. Lars Urlich from Metallica testified to Congress in July 2000 about the creative process and the human infrastructure that is involved in creating an album.

"Since what I do is make music, let's talk about the recording artist for a moment. When Metallica makes an album we spend many months and many hundreds of thousands of our own dollars writing and recording. We also contribute our inspiration and perspiration. It's what we do for a living. Even though we're passionate about it, it's our job.

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[20] http://judiciary.senate.gov/oldsite/1092000_sf.htm

"We typically employ a record producer, recording engineers, programmers, assistants and, occasionally, other musicians. We rent time for months at recording studios which are owned by small businessmen who have risked their own capital to buy, maintain and constantly upgrade very expensive equipment and facilities. Our record releases are supported by hundreds of record company employees and provide programming for numerous radio and television stations. Add it all up and you have an industry with many jobs--a very few glamorous ones like ours -- and a greater number of demanding ones covering all levels of the pay scale for wages which support families and contribute to our economy.

"Remember too, that my band, Metallica, is fortunate enough to make a great living from what it does. Most artists are barely earning a decent wage and need every source of revenue available to scrape by. Also keep in mind that the primary source of income for most songwriters is from the sale of records. Every time a Napster enthusiast downloads a song, it takes money from the pockets of all these members of the creative community." Then Ulrich got to the heart of the RIAA vs. Napster battle: "The backbone for the success of our intellectual property business is the protection that Congress has provided with the copyright statutes. No information-based industry can thrive without this protection. Our current political dialog about trade with China is focused on how we must get that country to respect and enforce copyrights. How can we continue to take that position if we let our own copyright laws wither in the face of technology?"[21] Fellow artists such as Beatles legend Sir Paul McCartney (whose record label, Capitol Records, is also represented by the RIAA), and Sir Elton John also publicly took anti-Napster positions.

By the following month, the Federal Court in San Francisco made a preliminary ruling that Napster was "effectively responsible for violating regulations defending copyright." "This hearing was Napster's attempt to escape responsibility for aiding and abetting wide scale piracy and -- not surprisingly -- they lost," said Hilary Rosen, President and CEO of the RIAA.

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[21] http://www.yourcongress.com/ViewArticle.asp?article_id=407

The 9th Circuit Court of Appeals upheld this ruling in July, and Napster was ordered to "remove from its central index all documents protected by copyright or close the service." The summary from this ruling stated, "The panel agreed with the district court that the record companies presented a prima facie case of direct copyright infringement by Napster users. The panel also agreed with the district court's rejection of Napster's affirmative defense that its users are engaged in fair use of the copyrighted material."[22] The ruling was appealed, and in the interim, the service was allowed to continue.

The Clinton Administration issued an Amicus Brief referencing section 1008 of the Audio Home Recording Act (AHRA). "The document excludes that section 1008 of the AHRA can protect Napster users and excludes the company from all possible accusations of violation of Copyright. The arguments contained in the Amicus Brief are based on the fact that the cited section of the ARHA talks about equipment intended to produce copies, while a Personal Computer cannot be defined a 'Digital Audio Recording Device', or similar instrument. Further, the ARHA allows and protects non-commercial domestic copying of contents protected by Copyright, but not their public distribution. In case of distribution, the AHRA would require payment of a royalty that neither Napster nor its users could pay, since it is reserved for manufacturers or importers of 'Digital Musical Recording' equipment."[23] Unsurprisingly, the RIAA took exception to this brief. "The Audio Home Recording Act (AHRA) of 1992 covers devices designed or marketed for the primary purpose of making digital musical recordings and provides these devices, and their manufacturers, with some protection from contributory copyright infringement claims. Those covered devices are required to incorporate technology to prevent serial copying. The manufacturers of covered devices also pay a royalty to copyright owners. General-purpose computers are not covered by the AHRA, so that statute imposes no obligations on Napster and provides no immunity for either Napster or its users...even if computers were covered, the AHRA would not allow the widespread distribution of music that is enabled by Napster." The court agreed with the RIAA's position.

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[22] http://www.riaa.com/News/filings/pdf/napster/napstersummary.pdf

[23] http://www.epidemic.ws/song-swapping/EN/A%20song-swapping%20timeline.html

By February 2001, Napster's appeals were exhausted. In September, Napster agreed to a $26 million settlement with the National Music Publishers Association for damages due to past copyright violations and $10 million for future rights. Traffic in February 2001 dropped by 60 percent as new online services based on advanced P2P protocols such as KaZaA, Morpheus and Grokster appeared, and within 15 months, Napster was bought for $8 million by the record company Bertelsman and filed for bankruptcy. Today, Napster (NAPS on the NYSE) is owned by Roxio and is a legitimate music downloading service with membership fees of $9.95/month that allows members unlimited access to over one million songs. Non-members can choose to download a song for $0.99 as well.

CHAPTER 5: THE MONETARY IMPACT OF ILLEGAL DOWNLOADING

We have explored the various legal issues that surround P2P services such as Napster, KaZaA, and Grokster. We now examine whether the actions of the RIAA are justified in terms of record sales and more global, economic measures, such as the consumer price index, average hourly wages, and unemployment. We will also examine some informal survey data to ascertain attitudes about the record industry.

Compact Disc Sales

The first statistic we will examine is the sales of compact discs over the period 1995 to 2004. We will not examine sales of older media such as cassettes and vinyl since they are not as easily converted to a digital codec such as mp3.

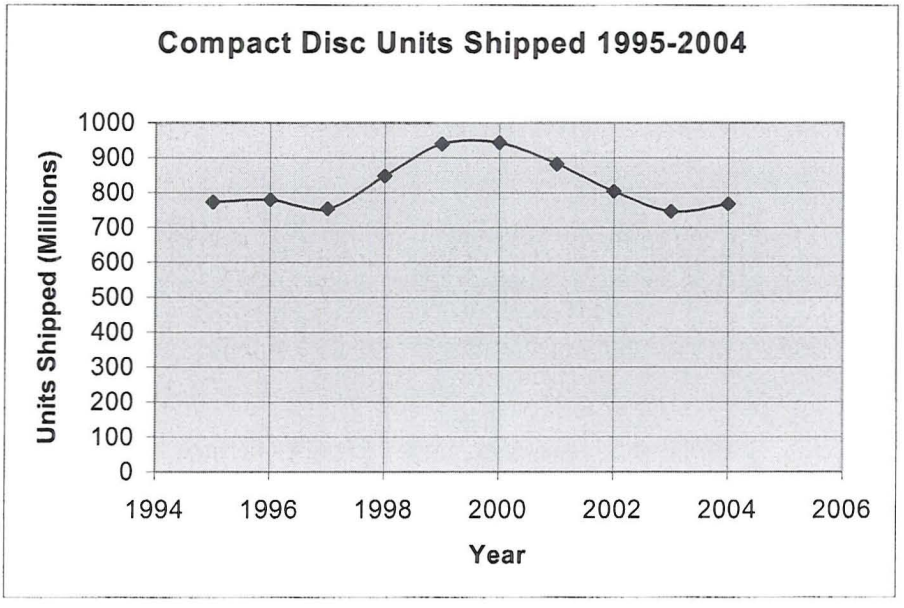

Figure 5.1a: Compact Discs Shipped 1995-2004

Figure 5.1a is the number of compact discs (in millions) shipped over the period 1995 to 2004, according to RIAA data. We can see that during the two-year period between 1999 and 2000, the number of units shipped reached an apex of over 940 million. Between 2000 and 2003, the number of units shipped fell approximately 200 million until rebounding slightly in 2004. Figure 5.1b is the sales of compact discs (in millions of dollars) over the same time span. We see the decrease in sales between 2000-2002 is not as pronounced as the decrease in units shipped, but the 2003 data corresponds

well to the units shipped. If we examine figure 5.2, compact disc sales per unit shipped, we see fairly consistent sales increases until 2002, at which point there is a decrease of a dollar per unit shipped from 2002 to 2004.

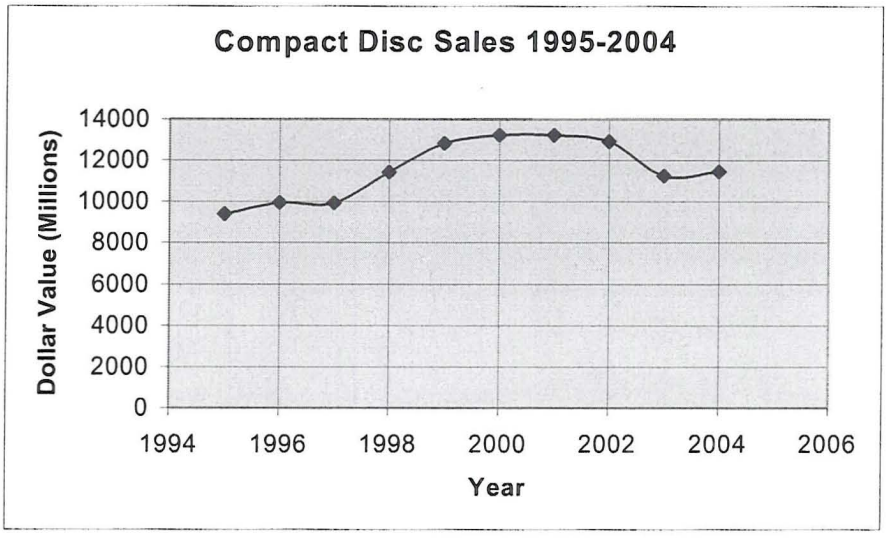

Figure 5.1b: Compact Disc Sales 1995-2004

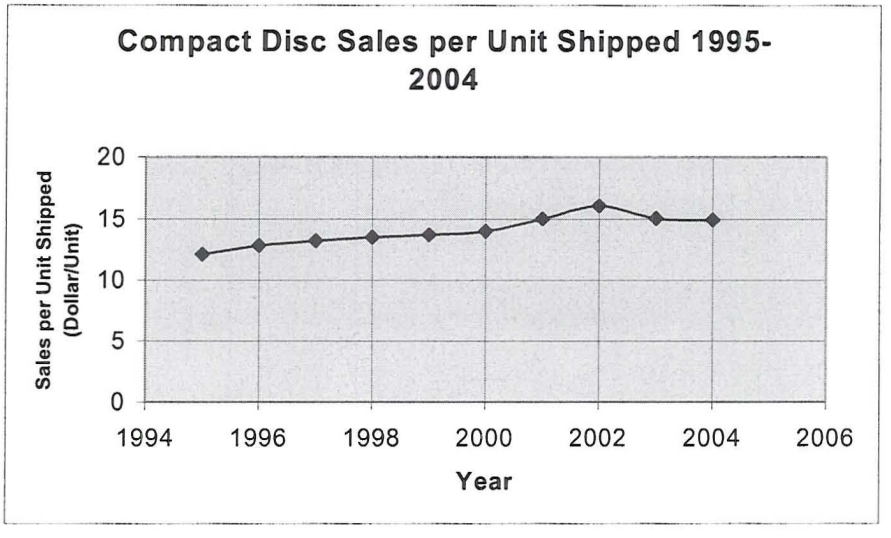

Figure 5.1: Compact Disc Sales per Unit Shipped 1995-2004

Perhaps more damning to Napster was data collected by Michael Fine, CEO of SoundScan, which since 1991 has been tracking record sales. SoundScan was asked to testify on behalf of A&M Records (represented by the RIAA) regarding the Napster

lawsuit. The data they collected reflects a loss of sales on college campuses that were considered to be the Top 40 "Most Wired" and colleges where Napster was recently banned. Figure 5.3 is shows national record sales and sales on college campus during the first quarter from 1997 to 2000. As we can see, national sales increased steadily over that period, while college sales have remained fairly constant over the same period.

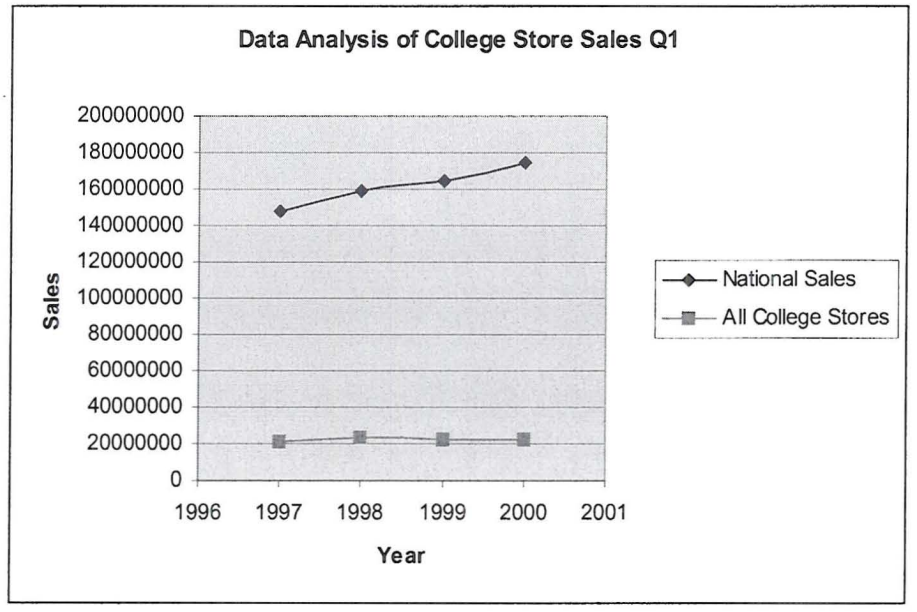

Figure 5.2: National and College Sales, 1997-2000 Q1

When we examine sales over the same period for the "Most Wired" and campuses where Napster was recently banned in Figure 5.4, we see sales have decreased significantly. Over that four-year period, sales at the "Most Wired" campuses fell 13 percent, while at campuses where Napster was recently banned, sales fell 11.7 percent. It is obvious that Napster was affecting the sales of the industry on college campuses.[24]

[24] All RIAA data can be found at http://www.riaa.com/news/marketingdata/facts.asp, and the charts were generated in Excel from this data.

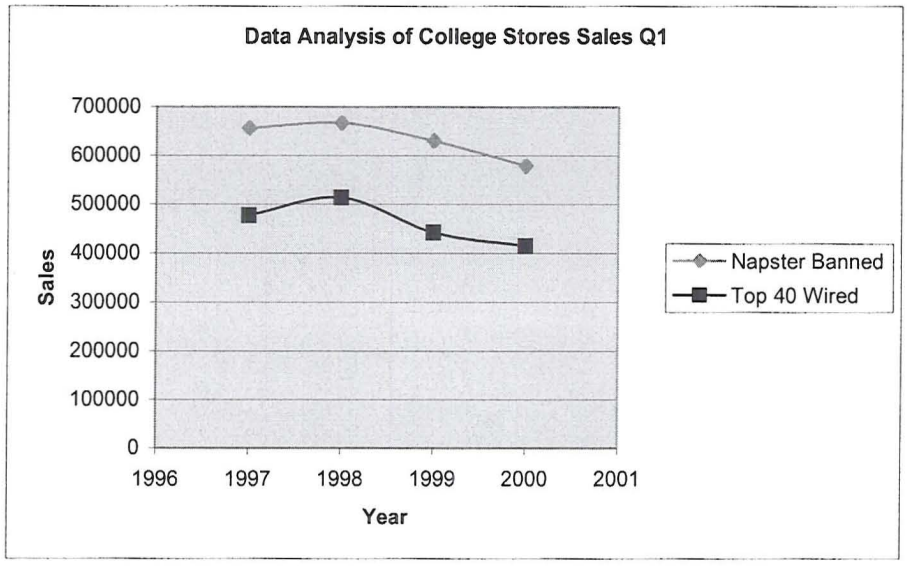

Figure 5.4: "Most Wired" and Napster Banned Campuses Sales, 1997-2000, Q1

Before we examine whether piracy is the root of decrease of sales, we will first examine broader economic indicators in the United States.

United States Department of Labor Data

We will first examine the consumer price index (CPI) between 1995 and 2004. The CPI is used to quantify the average change in prices of goods and services and is expressed as a percentage relative to a base value of 100 percent. Figure 5.5 plots the CPI based on data from the United States Department of

Labor.[25]

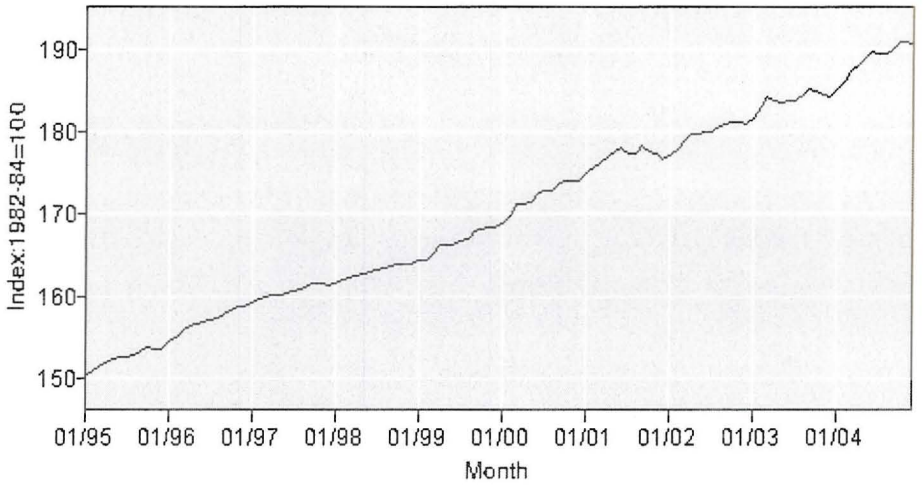

Figure 5.5: CPI from 1995-2004

The CPI, we can see, is increasing linearly over the period in question. If we look at the percent change from the end of 2004 to the beginning of 1995, the CPI has increased approximately 27 percent, or 2.7 percent/year. We can see no correlation between the CPI and the falloff of compact disc sales because the CPI is reasonably constant over the 10-year period, whereas the sales of compact disc reached an apex in 2000 and decreased steadily until 2004. Since CPI quantifies the change of prices of durable goods and services, the next statistic we can examine is the average hourly wage over the same time period.

[25] All data from the United States Department of Labor can be found at www.dol.gov in the "research library" section. It is generally in tabular form and graphs can be generated upon request.

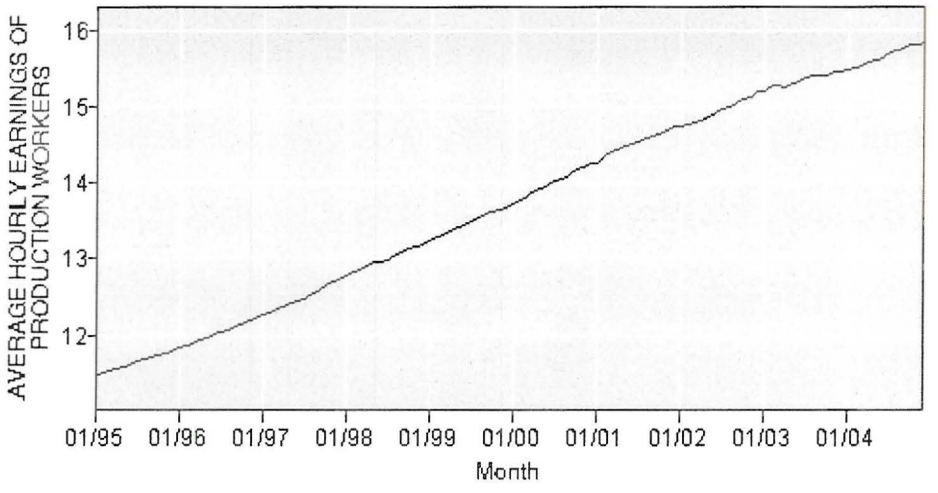

Figure 5.6: Average Hourly Earnings from 1995-2004

Figure 5.6 is the average hourly earnings of production workers measured from 1995-2004. Over that period of time, the average hourly wage increased approximately 38 percent from $11.85/hour to $15.85/hour. This rate of increase exceeds the rate of increase of compact disc sales per unit, 38 percent to 23 percent. Based on the CPI and the hourly wage data, it is easy to assert that the price of a compact disc is not unaffordable, yet the sales of compact discs decrease steadily from 2000 on. One more statistic we can examine is the unemployment rates over the period in question.

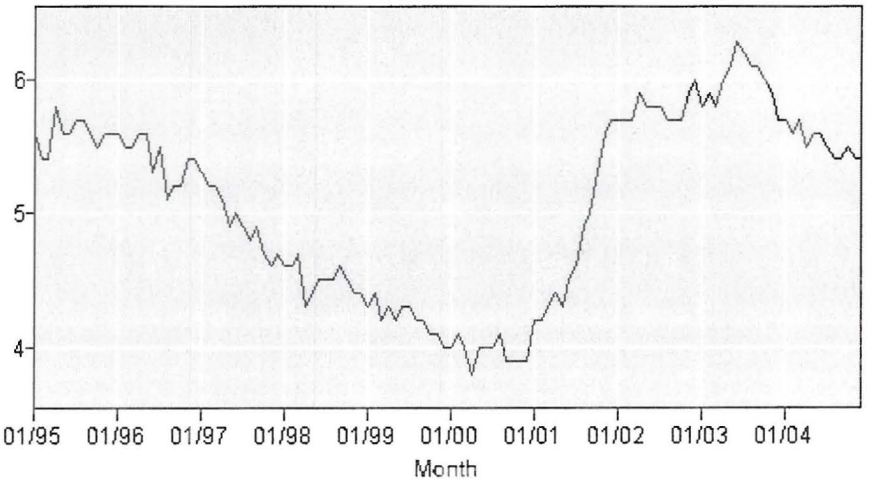

Figure 5.7: Unemployment rate from 1995-2004

Figure 5.7 is the unemployment rate of workers 16 years and older from 1995 to 2004. Between 1995 and 2001, the unemployment rate decreased from as high as 5.7 percent to as low as 3.9 percent. However, from 2001 to 2004, the rate increased from 4.2 percent to as high as 6.3 percent in 2003. This data mirrors the decrease in compact disc sales during that same period. One conclusion that can be drawn from examining the data is the unemployed were not spending their money on compact discs, simply because of their financial status. Compact discs are a form of entertainment and not an essential part of every day life; therefore, it is reasonable to assert out-of-work Americans were being more cautious with their money.

The monetary impact of piracy on the music industry, however, is not to be ignored.

Global Music Piracy: A Billion Dollar Business

The biggest advantage to the mp3 codec is the format is approximately one tenth of the size of a CD quality (i.e. .wav) audio file. As a result, it is possible to burn five full-length albums in .mp3 format onto a CD-R for every album in .wav format. An unforeseen consequence of this, however, is the proliferation of illegal copies of compact discs.

According to a report issued by IFPI (www.ifpi.org), which represents the recording industry worldwide, global music piracy is a $4.6 billon (US dollars) business, and one of three compact discs sold worldwide is a pirated copy. Compared to the rest of the world, industrialized countries like the United States, Japan, and the United Kingdom have a low piracy rate of less than 10 percent. Former Soviet-Block countries like the Ukraine, Poland, and the Czech Republic have piracy rates ranging from 25 percent to greater than 50 percent. IFPI research claims, "The trend in music piracy towards the CD-R format *(much of which now uses materially illegally sourced from the Internet)* has added to the music industry's problems" (emphasis added). The implication IFPI makes is services such as Napster (pre-lawsuit), KaZaA and Grokster contribute to global music piracy. IFPI is represented in the United States by the RIAA, and given the staggering amount of money that is being lost there is little doubt as to why the RIAA is pursuing individuals who illegally download music with alacrity.

It is perhaps useful to examine the attitudes people have about illegal music downloading to see if one prevalent attitude is apparent.

Informal Survey Results

The author conducted an informal, fifteen-question survey of twenty people to ascertain their musical spending habits, how often they download .mp3 files, and if they feel that illegal downloading is morally wrong. The respondents have a wide variety of occupations (graphic artists, system administrators, elementary school teachers, and engineers to name a few) and range in age from 20 to over 40 years old.

The first question was how many compact discs they buy in one year. Examining Figure 5.8, we see that nearly two thirds of the respondents purchase between 0 and 10 compact discs a year. Twenty five percent buy 10 to 20 compact discs a year, while only ten percent buy between 20 and 50 discs a year. Another question that was asked was if they felt compact discs are overpriced. These results are shown in Figure 9.

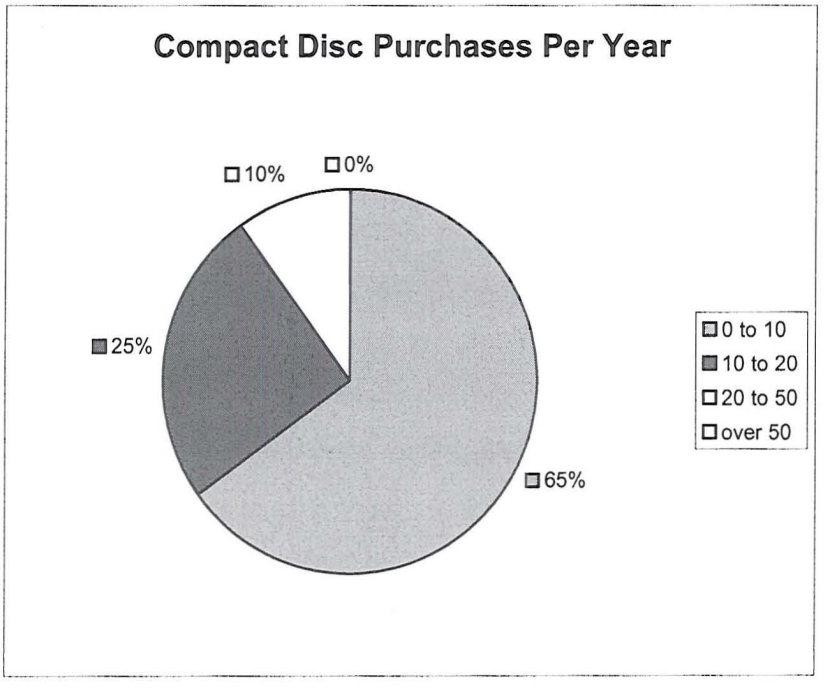

Figure 5.8: Compact disc purchases per year

Sixty percent of those questioned "somewhat agreed" with the assertion that compact discs were overpriced, while the remaining respondents were evenly split

between "somewhat disagree" and "strongly agree". Interestingly, no respondent strongly disagreed with the question, while the majority (80 percent) agreed on some level that compact discs are overpriced. However, when asked how often they visited P2P protocol services such as Napster, KaZaA, or Grokster, 70 percent replied not at all, while the remaining 30 percent visited such sites with varying frequency, replying "sometimes", "often" or "very often". The inference that can be made from examining this data is while the majority believe that compact discs are overpriced, that same sample size is not visiting P2P services and downloading mp3's as a means of getting free music. The results are in Figure 5.10.

When asked if it was "morally wrong" to download illegal copies of songs off the Internet, a majority (75 percent) of respondents replied it was "somewhat wrong", which implies a moral ambivalence regarding the issue. Figure 11 shows the results.

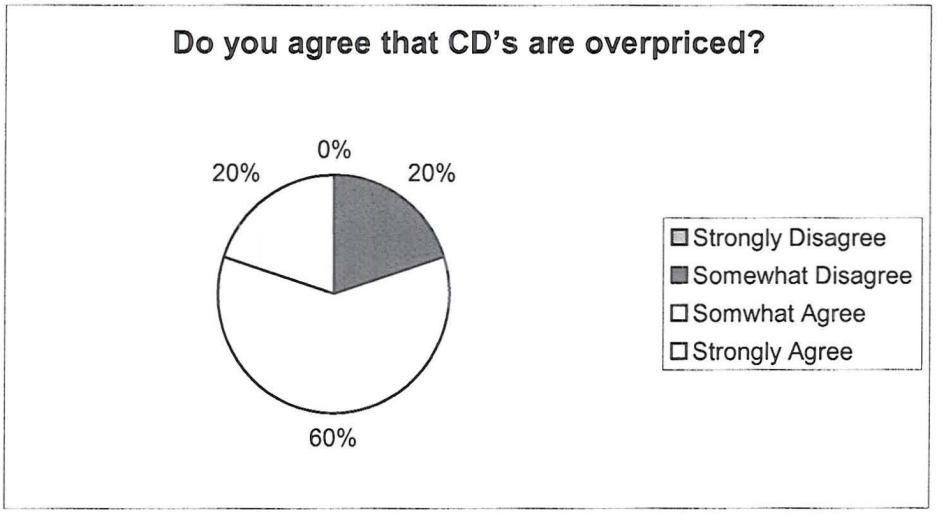

Figure 5.9: Do you agree that CD's are overpriced?

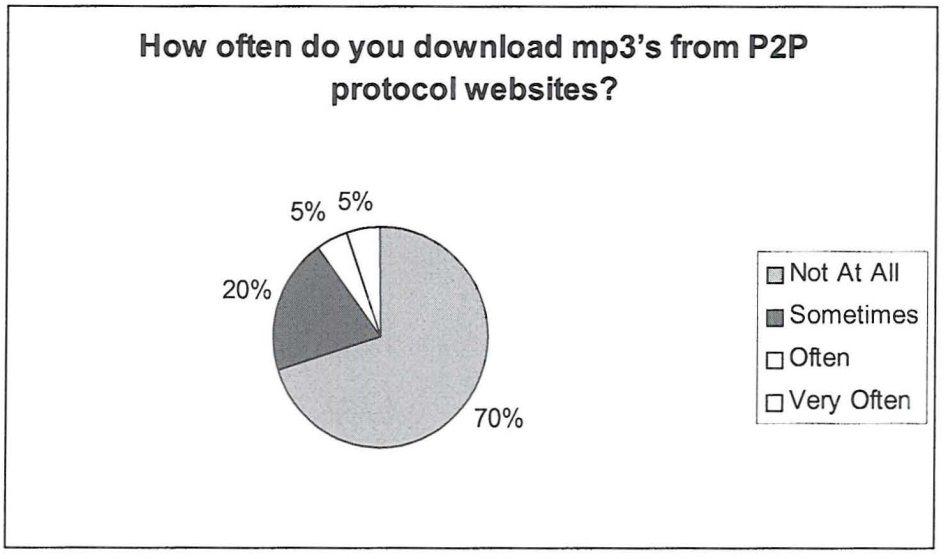

Figure 5.10: How often do you download mp3's from P2P protocol websites?

When asking that sort of question, it is helpful to gauge their general knowledge regarding the issue. One way to accomplish this was to ask how often they read musical publications such as Billboard, Rolling Stone, SPIN, and similar magazines. The results are shown in Figure 5.10.

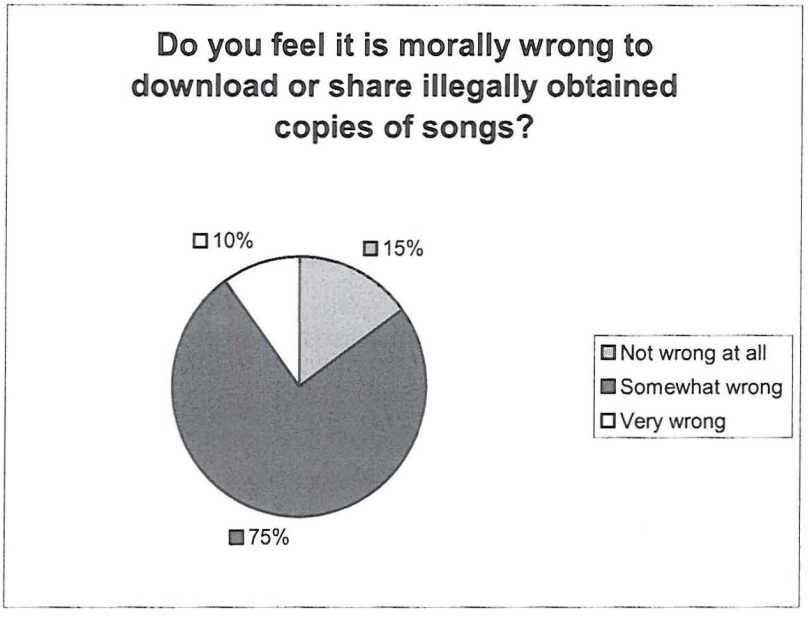

Figure 5.11: Do you feel it is morally wrong to download or share illegally obtained copies of songs?

Nearly two thirds of the respondents replied they either never read such publications or seldom read them, compared to 35 percent who sometimes read them. The conclusions that can be drawn from this data are somewhat ambiguous. The respondents held a variety of professional positions in the workplace and bought at least 10 compact discs a year, but the majority of them did not visit or seldom visited P2P services to download songs off the Internet (and thus become servers themselves). This can mean that they buy what they can afford to buy and are satisfied with that.

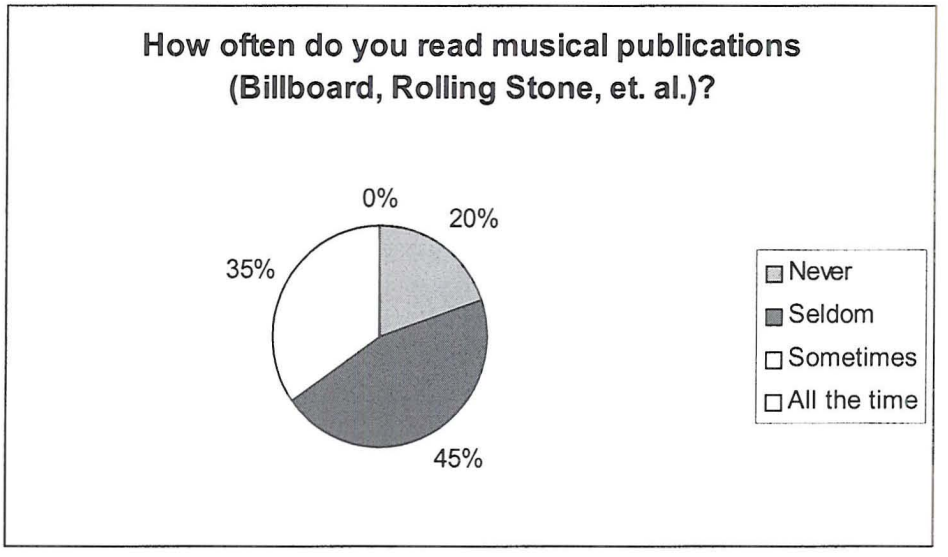

Figure 5.12: Frequency of reading musical publications

The "moral ambivalence" shown in Figure 5.11 can also mean that they don't consider music pirating that serious an issue in post-9/11 America. Other than terrorism and combat operations in Iraq, the biggest stories during the past four years have been the sexual abuse crisis in the Catholic Church, where children were victims, and the controversial collapses of companies such as Enron and World Com, where either thousands of jobs were lost or stockholders were defrauded. These events had tangible impacts on individuals and families, where music piracy would only seem to affect the music industry's bottom line. If we factor in other issues such as high housing costs, the skyrocketing cost of oil (thus affecting gasoline and heating oil prices), and higher unemployment rates, these every day concerns overshadow the plight of the music industry. It is also possible that the respondents are ignorant as to the magnitude of

music piracy. Figure 5.12 shows the respondents did not read a great number of musical publications, and as a result may be unaware of how much money is being lost. However, in an age of 24-hour cable television and the Internet, we know more about "rock stars" than ever before because of the greater exposure that they receive. We know that Sean "P Diddy" Combs has a $300,000 Bentley; we know Britney Spears will send her private jet on a coffee run; we know Sting has a large villa in Tuscany, Italy; we see today's rap stars wearing tens of thousands of dollars in jewelry. If the quality of life these personalities enjoy suffers because of music piracy, it's very difficult to tell judging from what we see on television or read on the Internet. Therefore, it may be hard to feel empathy for mega-rich musical personalities when their work is pirated.

Conclusions

The data from both the RIAA and SoundScan suggests pirating has done its share of damage to the industry. However, broader data from the Department of Labor suggests rising unemployment may also have an impact on record sales since sales began to drop as unemployment running. A third, subtler indicator may also be responsible for declining record sales: Apple's iPod and iTunes service has performed remarkably well since its introduction in 2003. Four million iPods were sold in 2004, and record sales over the first half of 2005 are down 7.6 percent compared to the first half of 2004. Ironically, iTunes is a legitimate service and one that suggests that people enjoy the convenience of shopping for music in their own home. While pirating is and will remain a problem for the industry, it is not the sole reason why sales have fallen since 2000.

CHAPTER 6: CONCLUSIONS AND POTENTIAL SOLUTIONS

According to the 2005 IFPI report on piracy, "The trend in music piracy towards the CD-R format *(much of which now uses materially illegally sourced from the Internet)* has added to the music industry's problems." The seeds of this problem were sown when a confluence of events took place in the mid-1990's. The number of people purchasing personal computers and getting Internet increased significantly during the last decade. Figure 6.1 shows the total number of computers (in thousands of units) sold during the period 1975 to 2004, and we can see IBM-compatible computers dominated the market share.

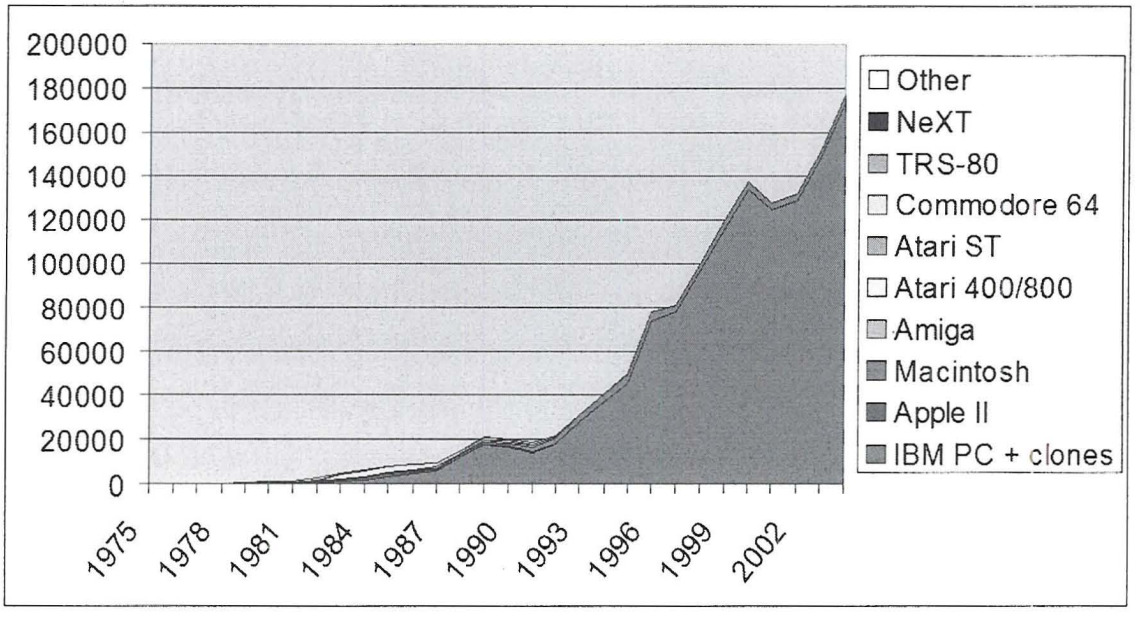

Figure 6.1: Market Share of Home Computers, 1975-2004

In 1993, the sales of IBM compatibles jumped significantly starting in 1993. Concurrently, Mosaic released its first graphics-based Internet browser in February of the same year, and the genesis of a market share war between future web browsers such as Netscape and Microsoft's Internet Explorer was in place. By 1990, 28 percent of all American households owned a CD player, 9.2 million CD players were sold annually, and 288 million CD's were sold annually. The final ingredient to this potentially explosive cocktail was added in 1995 when the mp3 codec was introduced. There was no

way to foresee in 1995 that in four years, an 18 year old college dropout would create software that would turn the music industry on its head.

The fundamental problem is us. When we purchase prerecorded music at a store such as Best Buy, Barnes and Noble, or Tower Records, we can clearly see copyright notices on the jewel case or, in the case of old vinyl albums, on the album jacket. Each time we duplicate that music and give it away to a friend or neighbor, we willingly ignore that copyright. Prior to the CD player, the most frequent methods of duplication were tape-to-tape or vinyl-to-tape duplication, and the record industry would tolerate it because duplication in that day and age took far more time and effort than it does today. Once mp3 encoders, Napster and future P2P networks came into fruition, all bets were off and the RIAA had no choice but to go after individuals. The problem is not only our own *making*, but our own *choosing* as well. As a result of this fundamental failure, potential solutions are hard to come by. The horse has left the proverbial barn on this issue.

The RIAA is forced to go after individuals with the hope that it discourages people from downloading or being an active server of digitized music. As of June 2005, the RIAA has sued 11,456 people, and 2,484 of those people have settled with the RIAA for an average settlement of $3,600. However, in April 2005 alone, there was an estimated 8.6 million Americans trading music illegally at any given time.[26] That is a staggering figure and one that proves that lawsuits against individuals are not deterring copyright violations.

One short-term, yet dramatic, solution to this problem is to put pressure on Internet Service Providers (ISP's) to block the transfer of mp3 files from computer to computer, after it has been established that doing this is legal. There is a legal precedent that Napster and similar services can be held accountable for enabling copyright infringement on a large scale, but it is the ISP's that provide access to the Internet, and as a result, culpability may be established even though the files are not in the ISP's possession. The ISP's are allowing the transfer over bandwidth provided by the government. An mp3 file has a recognizable, standard format and can be detected with the appropriate software. If such a file is detected, the ISP can block the transfer of the

[26] http://www.rollingstone.com/news/story/7380412/riaa_will_keep_on_suing

file. Repeated efforts to perform the transfer of mp3's should result in the loss of Internet service at the discretion of the ISP. The IP addresses of the server and the downloader can be sent to the appropriate authorities for notification. Depending on the amount of illegally downloaded material that is in possession, the RIAA can then go after these individuals and sue them for more money than in previously settled cases. The RIAA, assuming they have not done this already, should also run advertisements on television, radio, and the Internet (websites, streaming audio, etc.) and reveal the names of those named in RIAA lawsuits to discourage future illegal file swapping. This form of media exposure, provided its legal, may embarrass enough people to stop, especially if they run the risk of being "unmasked" during the six o'clock news.

File swapping would not be an issue if the record companies were not losing so much money because of it. Towards that end, if the RIAA is concerned about the profitability of the record labels and the well-being of the industry's recording engineers, marketing staff, and publicists, than it should encourage its members to alter the way it runs its business. The RIAA claims that only 15 percent of recording artists are profitable and those profits help finance the other 85 percent. If the labels are only finding 3 successful bands out of every 20 they sign to contracts, it implies the people who make these decisions aren't very cognizant of what the public likes and dislikes. They have to save money by making better decisions on which artists to sign to record contracts. If this reduces the company's overhead, then it should translate into a reduction of prices and more music fans will buy the product.

Long term is where the battle may potentially be won. As technology evolves, we are assured that uncompressed digital audio is not the final word in digital music. The RIAA, with the approval of its members (i.e. the record labels), should commission our universities and research centers to invent and patent the next generation of digital audio. Within ten to fifteen years, quantum computing may bring an unprecedented level of fidelity to music. It may very well be possible to encode within this new format a signature that not only identifies the name of the artist and song, but the ID of the record label as well. That ID would act as a pirate-spoofing signature that will prevent illegal duplication. The media itself should be smaller than a compact disc. Companies such as Sony should explore the potential costs of implement a new media player and work with

computer companies like Dell to establish a standard for playing this new type of file. This way, not only does the RIAA membership win, but industry and the marketplace wins as well.