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Copyright Law in the Digital Age

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Abstract

Copyright infringement of digital media is an ever-increasing problem. While there have been attempts to solve this problem through both legal and technological measures, no solutions have been satisfactory. Many people are uneducated about the legal aspects, and technological measures are easily circumvented. By analyzing various documents and news articles, and by conducting interviews with various people representing all sides of the issue, the team was able assess the situation and to provide recommendations to improve it.

Background

A major issue in today's society is the file-sharing and piracy of digital media. According to a recent study, approximately 36 million people in the U.S. alone share or buy copyrighted music and video files over the Internet.[1] Many copyright owners feel as though they are not making a full profit anymore because they are not selling as much of their copyrighted works as they should be. There has been much discussion over this topic in recent years and the debate still goes on. With advancements in technology the sharing of files increases creating a greater concern for the copyright owners.

The original copyright laws in the United States date back to the year 1790. This act covered the rights of authors for books, charts and maps that they had created. These rights include the printing, publishing, and selling for up to fourteen years of its copyright. If necessary, the author of the copyright could extend copyright life for an additional fourteen years after the original term expired. The act only covered the rights of authors who were U.S. citizens to print, reprint, and publish their works. If the act was violated then it is said in the original act that the infringer "shall be liable to suffer and pay to the said author or proprietor all damages occasioned by such injury"[2]. From here on out the copyright act was in effect in the United States.

There was then a revised version of the copyright act in 1909. This act included the rights of authors who created musical works, photographs, and works of art. It also extended the life of a copyright to twenty-eight years and increased the extension period to twenty-eight years as well. The change in the copyright life was done to help protect authors from the short time period it had been before. The previous fourteen year period had proven to be troublesome for authors because they were not able to hold their copyrights into their older age. This was a problem as

[1] (Madden & Rainie, 2005)
[2] (Copyright Act of 1790, 1790)

most famous works were known to take time to become popular. Although these new rights may have seemed sufficient at the time, there would be more changes made to the act in the future.

The first major move to improve the copyright law in the United States came in 1976. The United States, after many years of investigation into the matter, wanted to be compliant with Universal Copyright Convention which was established in 1952 by numerous countries around the world. The U.S. also needed to improve its copyright laws due to technological advances since the last update of its copyright laws was in 1909. Televisions and radios had been introduced into the world and provided other avenues for copyrighted works to be distributed. The Copyright Act of 1976 included the same guidelines as before but added more policies that reflected the change in technology. It included the regulations to copyright motion pictures and sound recordings. The new act also extended the term of a copyright to life of the author plus fifty years, once again to help protect the author from losing the rights to his own work. It is also stated that the surviving spouse and children could continue to collect royalties from an author's work when the author does die. A brief description of fair use was also given in this act. Fair use was described quite vaguely as it only pertained to the nature of how the copyrighted work was being used and how it affected possible profit of the work. In section 107 of the act, fair use applications for violating an author's rights are stated by saying that persons may use copyrighted material, "for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright."[3] Misuse of a copyrighted work would be found if a violator was able to make a nominal profit or some form of gain off duplication of the copyrighted work. There is, therefore, no fine line between what use does and does not violate a copyright.

[3] (Copyright Act of 1976, 1976)

Fair use follows guidelines, written in the Copyright Act of 1976, which can be interpreted in many different ways. First, "the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes" pertains to the fact that one may use part or the whole copyrighted work as long as it is not intended to help the copier further themselves commercially of financially. The second part, "the nature of the copyrighted work" is primarily left up to the judgment of the copier and how he plans to use the copyrighted work. If there is no harm done to the credibility and integrity of the original work then it may be considered fair use. There is also the principle that "the amount and substantiality of the portion used in relation to the copyrighted work as a whole" which means as long as only a small portion of a copyrighted work is being used then it is allowed as well. Although, there is no defined length of how much can be copied which produces a conflict between authors and copiers. Lastly, it is stated that the copying of a work may be allowed if it does not affect the value of the original work.[4] All of these points can be perceived differently depending on which side one may look from.

A case dealing with the copyright act was brought up in 1976. *Sony Corporation of America versus Universal Studios Incorporation*, also known as the Betamax case, set a precedent for all copyright cases like it today that have arisen due to developments in technology. The Betamax case allowed for technologies that could record copyrighted media to keep growing, even though they may be contributory infringers to the copyright law.

The Betamax was a video tape recorder (VTR) that allowed users to tape one television program while watching another program. A user could also record programs while he was not at home, using a timer setup on the Betamax. This posed a problem for the producers of

[4] (Copyright Act of 1976, 1976)

copyrighted programs who feared that the recordings of their programs could potentially diminish their revenue.

In the final decision of the Betamax case by the Supreme Court it was decided that time-shifting (recording a program for later viewing) of television programs for personal use was a legal action. In the opinion of the Supreme Court written by Justice Stevens he says, "the average member of the public uses a VTR principally to record a program he cannot view as it is being televised and then to watch it once at a later time."[5] It constituted under the rights of fair use that time-shifting of copyrighted programs by the public is a legal action. Universal argued that the time-shifting was not fair and was cutting into their profits because people did not have to watch the commercials if they had recorded the program. The court decided that time-shifting should be permitted since a number of copyright holders approved it and that if the recordings were intended for personal use then it wouldn't violate the copyright laws. The court agreed that, "time-shifting may enlarge the total viewing audience"[6], so it could potentially benefit the producers of the copyrighted works financially. Since the video tape recorders were primarily used for a legitimate cause the court saw no way to ban the product just because a small number of users may commit illegal actions with it.

The technological practice of preventing copyright infringers from copying media was never fully developed by the media industry nor the producers of video tape recorders. It was brought up in the Betamax case by Universal Studios that there was a way to allow only certain television shows to be recorded by video tape recorders while others could be blocked. However, Sony had come up with a way to remove these jamming signals sent out by broadcasters so that the user could record any broadcast. This was allowed because even if a program was

[5] (SONY CORP. v. UNIVERSAL CITY STUDIOS, INC., 464 U.S. 417 (1984))
[6] (SONY CORP. v. UNIVERSAL CITY STUDIOS, INC., 464 U.S. 417 (1984))

copyrighted, it could still be recorded for personal use or some other sort of fair use. The closest that Sony ever got to trying to stop infringers was by putting a warning of the United States copyright laws in the manual. The manual says, "Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of United Sates copyright laws."[7] Although it may not have been the main focus of their manual, it still did remind the user that everything they may be recording is not always legal.

In instances like the Betamax case, the technology of the time was not advanced enough to help control copyright violations effectively. To stop copyright violators it would have meant that total production of products like the Betamax would have to have been cancelled, which would have put a tremendous burden on the businesses selling the product and the economy as a whole. The main idea behind the recording devices was that for the most part the owners would not misuse them or commit illegal actions. If almost everyone was a law abiding citizen, then there would be no real worries of people infringing on copyright owners' rights. Lots of time and effort have gone into making audio and video files easier to handle in recent years. All this work is good for the sake of making life easier and helping the technology around the world become more advanced, but has been the basis of so much trouble along the way as well.

During the late 1980s and early 1990s, considerable research went into the subject of lossy audio compression. By 1993, the MPEG-1 standard was released, which included the MP3 (MPEG-1, Layer 3) audio definition. This definition described the process for both encoding and decoding audio into and out of the MP3 format that could be implemented in either software or hardware. With a good implementation, this format could deliver near CD quality audio at less

[7] (Sony Corporation, 1975)

than 1.5 bits per sample, while an uncompressed audio CD uses 16 bits per sample. This allows for audio files compressed with an MP3 encoder to sound almost identical to the original uncompressed version found on an audio CD, yet take up less than one tenth of the storage space. Considering the relatively small memory sizes of hard drives found in personal computers at the time, if one wanted to store CD quality audio files on his computer, this was a major breakthrough. The other huge impact this had was on file transfer times, considering the typical slow 28.8kbps modems at the time. If an uncompressed audio file took ten hours to transfer over a modem, the equivalent MP3 version would take only one. Despite all of this, computers at the time were not actually fast enough to decode the MP3 format in real time, and although MP3 sizes were small, hard drives still could not store very many, and space was needed for other more important things for most people. Thus there were no public software MP3 decoders available until 1995, when Fraunhofer released the first codec for the PC as shareware, allowing PC users to listen to MP3s in real time on their computers.[8]

During the 1990s personal computer ownership grew tremendously. In 1989 it is estimated that 15.0% of U.S. households owned at least one personal computer. By 1997 this more than doubled to 36.6%, and by 2000 was up to 51.0%. Also in 2000, about 41.5% of U.S. households had their computers connected to the Internet. Not including the millions of other Internet users in other countries, this connected together roughly 44 million households via their computers.[9] Toward the end of the 1990s, improvements in computer technology including faster CPU speeds and much larger hard drives made it feasible for many computer owners not only to play MP3 files back in real time, but to store many CDs worth of them on their hard drives, while still having room for their other important software. This, combined with the

[8] (Fraunhofer IIS, 2007)
[9] (Newburger, 2001)

significant rise of these computers connected together via the Internet by this time gave rise to a new phenomenon: peer to peer networks.

Peer to peer (P2P) networks allowed an Internet user with a special piece of software, to be directly connected to all of the other Internet users also connected to the network, and share files with them. All a user had to do was type in the name of a particular file he wanted, and the special P2P software would search all the other users for that file and then display all the results, just like a web search engine, but for files shared by other users of the P2P network, rather than pages on the world wide web. The user could then download the files of their choice returned by the search. The other option a user typically had was to browse all the files being shared by a particular user, and download the ones he wanted. The first of these P2P networks was Napster, released in 1999, and it allowed only the sharing of MP3 files.[10]

With computers capable of playing and storing gigabytes worth of MP3s, about 40% of US households connected to the Internet, and the release of Napster, the digital age of copyright infringement began. Not surprisingly, almost immediately in 1999 the RIAA filed a lawsuit against Napster.[11] In 2000, when Metallica discovered that a new song of theirs was available on Napster even before its official release, they too brought a lawsuit against Napster.[12] Unlike the outcome of the Betamax case however, before long in 2001 the Napster network was shut down.[13] One of the main points that distinguished Napster from the Betamax was that while the primary purpose of the Betamax was to record television shows for later viewing, the primary purpose of Napster was to share numerous copies of mainly copyrighted music with other people. The record companies claimed that this activity was detracting from record sales of the

[10] (Tyson)
[11] (Menta, 1999)
[12] (Bowman, 2000)
[13] (RTE Entertainment, 2002)

music that was shared, and thus could not be considered fair use. Others however believed that this actually did not detract from record sales. Many people for example, after downloading and listening to songs, decide to buy the albums containing the songs they like, similar to the way the radio helps to advertise music. According to a recent statistical study examining the effect of illegal music downloads on music sales, it found that "the estimated effect of file sharing on sales is quite small (slightly negative) and statistically indistinguishable from zero."[14]

The end of Napster however was not the end of P2P networks. In fact it was just the beginning for numerous others. With all the publicity Napster gained from the lawsuits, it became quite popular before it was shutdown, with over 20 million users. With the idea of P2P networks becoming so popular, many new ones sprung up to replace Napster. Many of these were designed differently so as not to rely on central servers, making them difficult if not impossible to shutdown like Napster was.[15]

Shortly before Napster was released, the Digital Millennium Copyright Act (DMCA) was signed into U.S. law in October 1998. This revision to U.S. copyright law dealt with many new arising issues due to the rise in use of the Internet. One of the major issues it dealt with was the liability of Internet service providers concerning copyright infringement by their users. Another issue it dealt with was circumvention of copyright protection schemes. For example, if a CD was distributed that had a mechanism in it to prevent CD copying software from copying the CD, the DMCA effectively made the act of circumventing that copy protection mechanism illegal.[16]

[14] (Oberholzer-Gee & Strumpf, 2007)
[15] (Evans, 2000)
[16] (Digital Millennium Copyright Act, 1998)

In April of 2003, Apple launched the iTunes music store, selling individual songs for $0.99 each.[17] This was Apple's attempt at a legal alternative to something like Napster. This method of legally distributing music over the Internet quickly became popular, and other companies have followed suit. In October 2003, Roxio released a new pay version of Napster, similar to iTunes.[18] Both services pay royalties to the record companies that they deal with. There are some downsides to these new types of legal music distribution services however. Besides the fact that they are not free, they do not have the vast amount of songs available on the P2P networks, as they can only provide what the record companies and artists allow them to.[19] Therefore, obscure and less popular current music, as well as much older music is not available on these services, while much of this music can be found circulating on P2P networks. Over the years however these services' libraries have been growing steadily.

The other issue with these services is that the music files are protected with DRM schemes. While what these protections do exactly depend on the service, the general idea is that it restricts what you can do with the music files. With iTunes for example, it allows the user to store the songs on a maximum of five computers at a time. It also makes it impossible to listen to the songs on any portable media players other than on Apple's own iPod, or any software media players other than in iTunes itself, since Apple does not license its DRM technology to other companies.[20] If a user wanted to be able to listen to a song bought from one of these services on a device not allowed due to the DRM, he would have to strip the DRM protection from the song file. This however would violate the DMCA as explained above. So while these new legal services are definitely a step in the right direction, millions of Americans still stick to

[17] (Borland & Fried, Apple launches iTunes for Windows, 2003)
[18] (Smith, 2003)
[19] (Huhn, 2006)
[20] (Cohen, 2005)

the illegal P2P networks for their music and other copyrighted media. The question now is what can be done to satisfy both the industry and the users?

Various industry practices and technologies have been continuously evolving to paint a very complicated picture of how copyright law applies to digital media today, in 2007. Digital rights management technologies for all kinds of digital media including audio and video are constantly released, updated, and refined, and users fight against these developments and often overcome them just as quickly as they are produced. The previous peer-to-peer networks of the early 2000s, which were centralized and easy to shut down, have since given way to an extremely popular program called BitTorrent, originally created by Bram Cohen in 2001. Lawsuits between companies and end consumers regarding digital copyright law happen on an almost daily basis. These issues and more are occurring on the cutting edge of the digital copyright law landscape, and will affect the future of that landscape. In order to understand what the future holds for digital copyright law and for DRM, several pertinent cutting edge issues, as well as how they may play out in the future, will be now be briefly discussed.

One of the biggest aspects that will shape the future of digital copyright law and DRM is how DRM technologies are evolving and being put to use, themselves. When music recording industries realized that online distribution of their products had the potential to be very popular (noting the popularity of the aforementioned peer-to-peer networks,) the concept of the online music store was born. The quintessential example of this business model is Apple, Inc's iTunes Store, which was originally created to give consumers a legal way to purchase songs for use with the company's popular iPod digital audio player. Because Apple originally did not want users to pay for a song or an album and then distribute or give away the same content for free, they built a DRM scheme called FairPlay into the iTunes store that limited users to being able to play

purchased content on their iPod, and their iPod alone. Other companies took similar actions. Microsoft, Inc. created a DRM-based online music store for their Zune audio player. The previously mentioned Napster network has also since been reborn as a DRM-based music store. The previously mentioned Betamax case was important because it dealt with the then-new concept of time-shifting of media. Modern digital media is inherently both time- *and* space-shifting (consumers can potentially listen to MP3s or other digital audio files whenever they want, and can send them over the Internet to many other people, without ever traversing a physical distance), and digital audio distribution companies view DRM as one of the most effective ways of limiting the time- and space-shifting nature of digital audio.

This state of affairs is changing quickly. Many consumers did not like having limited rights to the media they supposedly purchased for themselves, and eventually companies starting listening to them. On February 6, 2007, Apple CEO Steve Jobs wrote an open letter entitled 'Thoughts on Music', urging record companies to allow their music to be sold DRM-free.[21] Surprisingly, on April 2, 2007, Apple and the record company EMI announced[22] that songs in EMI's catalog would be available for purchase from the iTunes store, DRM free (and at a higher quality and slightly higher price than the DRM-based songs.) Other companies began to follow suit. Amazon.com launched a DRM-free online music store on September 25, 2007, with the support of record companies EMI and Universal. Microsoft's Zune Marketplace is expected to also start selling some of its catalog without DRM.

Furthermore, more and more musicians are finding that they don't need the backing of record companies that limit their rights, as well as the rights of consumers who seek to enjoy their music, to be successful. The band Radiohead announced on October 1, 2007 that they

[21] (Jobs, 2007)
[22] (EMI Group, 2007)

would independently release their seventh studio album, *In Rainbows*, without the aid of a record label.[23] Radiohead independently released their new album in two very novel ways. On October 10, 2007, Radiohead made their new album available as a digital, DRM-free download on their website--and the customer directly pays the band for the music, paying whatever amount the customer deems suitable (ranging from £0.00-£100)--in other words, consumers have the ability to pay what they believe the music is worth. Radiohead is also selling a boxed version of their album, that includes CD and vinyl versions of the album, as well as a bonus CD with extra songs, lyrics, and photos of the band. Similarly, on October 8th, 2007, Trent Reznor of the band Nine Inch Nails announced on the band's official website that his band, too, would no longer be backed by a record label:

> I've waited a LONG time to be able to make the following announcement: as of right now Nine Inch Nails is a totally free agent, free of any recording contract with any label. I have been under recording contracts for 18 years and have watched the business radically mutate from one thing to something inherently very different and it gives me great pleasure to be able to finally have a direct relationship with the audience as I see fit and appropriate.[24]

Before the advent of digital media, it would have been hard to even imagine something like DRM. After the novelty of digital media led to piracy, DRM was invented and imposed, but now the situation appears to be fluctuating to somewhere in between. Consumers are now getting more and more options for legally purchasing digital media without being limited in how that media is used and enjoyed, and it's easy to see that the picture is changing: artists are working very hard to give consumers as many of those options as possible.

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[23] (Masnick, 2007)
[24] (Reznor, 2007)

Further provoking change in the industry are organizations like the Electronic Frontier Foundation, more commonly known as the EFF. The EFF describes itself as "a nonprofit group of passionate people—lawyers, technologists, volunteers, and visionaries—working to protect your digital rights."[25] Their motto is "Defending Freedom in the Digital World". They are a consumer advocacy group that sets out to defend the first-amendment rights of consumers in today's digital age. The EFF educates consumers about topics such as the legality of file sharing, fair use and DRM, free speech, intellectual property, and many more concepts and ideas. The EFF also keeps track of relevant court cases that stem from or involve this issue. The EFF is an excellent starting place for the average consumer to get acquainted with these concepts.

Another important technology that has played a huge part in shaping digital copyright law, and which will continue to do so, is the invention of the aforementioned program BitTorrent. BitTorrent became very popular after most of the older, rudimentary peer-to-peer networks were shut down in the early 2000's. Rather than having a bunch of users connect to one central service, and send large files to each other directly, BitTorrent allows files to be distributed very quickly and efficiently across the Internet by breaking up files into thousands of tiny chunks, and then having users upload and download these chunks to and from each other, simultaneously--all without making use of one centralized service that is easily shut down. BitTorrent, by design, accomplishes the very thing that DRM tries to limit: making any digital media extremely time- and space-shiftable. Because BitTorrent is still a very large peer-to-peer network, it is still possible to identify individual users on the network. Organizations such as the Recording Industry Association of America (RIAA) and the Motion Picture Association of America (MPAA) connect to and search these networks for users who may be sharing or

[25] (Electronic Frontier Foundation)

receiving content illegally, request or demand the users' personal and contact information from the users' Internet service providers, and then sue the users for copyright infringements, citing exorbitant amounts of money in damages.

BitTorrent is just one of many avenues for acquiring digital media (however illegal it is.) Consumers are now given so many options for acquiring digital media; should they download media legally or illegally? Should they buy a physical CD or DVD? The variety and breadth of these options raise many intriguing questions. Which aspects of participating in any peer-to-peer networks specifically apply to digital copyright law? Is copyright law violated when receiving digital media? Sending it to someone else? Or is it in both of these situations?

Furthermore, how effective is DRM at accomplishing its goals? What are its benefits and drawbacks for consumers, as well as for the industries distributing the media? Is the recent advent of legally purchasable, DRM-free media going to revamp the industry? How can industry practices, laws, and technologies be changed to benefit both consumers and the companies selling media to these consumers? Do they need to be changed at all? These questions and more are what will be explored and discussed for the remainder of this paper.

Methods

In order to gather a complete perspective of views regarding Internet piracy it was necessary to interview several different subjects in various occupations. These interviews could help with discovering people's different interpretations of the copyright law and the numerous ways that people think the problem of Internet piracy could be solved. Interviewees ranged from the entertainment industry, to lawyers, to technology companies. In the end, the interviews helped with finding the best solutions to prevent piracy and the interviews had a considerable impact on the recommendation in this report.

The first interview was with Jen Yip from Creative Commons. Creative Commons is non-profit organization which creates a license for copyrighted works under the terms that the owner wants. In this interview, it was discovered the goal of Creative Commons was to create a less strict version of the copyright law so that more works could be open to the public. This is a growing organization which hopes to become more visible to the public so that more people will begin to use its licenses.

Another interview was done with an IP manager of a major entertainment company which cannot be named. From this interview it was found that company would like to work together with ISP's to find a solution that would prevent Internet piracy. It was also concluded from this interview that the company believed other technologies would come along which could hinder Internet piracy or provide another alternative to it. The company also believed that eventually the general public, once educated enough, would no longer continue to allow Internet piracy.

Elizabeth Kaltman, the director of corporate communications from the MPAA, also was able to provide answers regarding the copyright law in the digital age. She provided answers to

questions like “how the MPAA was educating the public about Internet piracy?” and “how much Internet piracy was actually hurting the industry?” The information presented by Elizabeth Kaltman was full of facts and gave the report great insight to how Internet piracy was affecting the movie industry and the world as whole.

The next interview was with Vance Ikezoye from Audible Magic which is a technology company that produces possible ways to help limit Internet Piracy. Audible Magic uses network filtering and fingerprinting to help the fight against illegal downloads and the company believes that its technology is the way of the future. This source was able to provide insight on what the current technology of the world can and cannot do.

Mary Casey, from The Harbor Law Group, was able to contribute useful information about copyright law and how it is suppose to be interpreted. Mary Casey discussed many past cases which help clear up the meaning of the law as it pertained in the past. She was also able to discuss how she believes a solution will be found and what can be done to help.

There was also an interview completed with Rashmi Rangnath from Public Knowledge. This is a non-profit organization that is trying to create openness for the rights of copyrights and communications. This organization believes that the entertainment industry would have too much control if everything was protected by DRM or filtered over networks. Rashmi also was able to provide some recommendations for what she thought could be changed with the law.

Overall, the interviews that were completed helped give this report a perspective from many different occupations and organizations. This report contains much useful information which could not have been found if it was not for the people that were interviewed.

Technological Developments

INTERNET CONTENT FILTERING

One of the newest options for preventing illegal online file sharing to be seriously considered by various content owners and organizations, including NBC Universal and the MPAA, is network filtering. The idea behind network filtering for this purpose is that all traffic across a network is scanned in some way, to determine whether or not there are unauthorized file transfers going on. If there are, the filters will stop them. This approach can be implemented either by P2P networks themselves, or for the entire Internet by an ISP.

In 2005, the FCC adopted the following network neutrality principles:

- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to access the lawful Internet content of their choice.*
- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.*
- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to connect their choice of legal devices that do not harm the network.*
- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to competition among network providers, application and service providers, and content providers.*[26]

[26] (FCC, 2005)

These network neutrality principles effectively preclude the use of network filters as described above by ISPs, because filters prevents consumers from using certain applications and services of their choice. While one may argue that P2P networks are used for illegal purposes and therefore should not be protected by network neutrality, the fact is that the technology behind P2P networks has many potential legitimate uses, and therefore cannot be blocked under network neutrality policies.[27]

In April of 2007, the FCC released a notice of inquiry regarding this Net Neutrality, asking "for specific examples of beneficial or harmful behavior," and "whether any regulatory intervention is necessary."[28] NBC Universal submitted a comment responding to this notice of inquiry, stating that the rapid growth of broadband networks is fueling "fast – and free – illegal distribution of digital content, primarily through peer-to-peer ("P2P") file 'sharing'."[29] Their comment goes on to say that the US government would not "permit Federal Express or UPS to knowingly operate delivery services in which 60-70% of the payload consisted of contraband, such as illegal drugs or stolen goods,"[30] so why allow this to happen over the Internet? Toward the end of NBC's comment, it explains that the FCC must require all broadband service providers "to prevent the use of their broadband capacity to transfer pirated content, especially when such use represents huge percentages of their capacity and reduces the quality of service to other subscribers. Whether those means consist of relatively low-tech but potentially effective steps such as forwarding notices to customers who have been identified as infringers, or using

[27] (Roush, 2006)
[28] (FCC, 2007)
[29] (NBC Universal, Inc., 2007)
[30] (NBC Universal, Inc., 2007)

increasingly sophisticated bandwidth management tools as and when they come online, the obligation to deploy such measures must be explicit."[31]

According to their comment, NBC Universal clearly wants ISPs to use filtering technology to rid the Internet of illegal file sharing. Exactly what type of technology should be used they do not say, but what they do want is the latest and most sophisticated technologies to always be employed as they become available.

As a reply to NBC Universal's comment to the FCC, Public Knowledge, the Electronic Frontier Foundation, and other advocacy groups wrote a paper outlining the dangers of changing the open nature of the Internet to allow for this type of network filtering that NBC Universal feels is necessary.[32] They explain that there are two basic types of network filtering; the first one being content inspection. Content inspection actually analyzes the data of all Internet traffic, looking for unauthorized transfers of copyrighted content. The paper mentions one such existing system of content inspection by a company called Audible Magic. Audible Magic's system works by having a large database of information about short sections of millions of different songs. If the system sees a transfer of a file containing a known piece of a song, it will assume that that particular song is being transferred illegally and stop the transfer.[33]

The second type of network filtering described is traffic analysis. This type of filtering does not actually analyze the data being transferred, but rather the nature of the traffic. Different network protocols send data in different ways, so the overall traffic pattern of say a P2P file transfer looks different from the traffic pattern of browsing websites. In this way the filter tries

[31] (NBC Universal, Inc., 2007)
[32] (Public Knowledge, Et Al., 2007)
[33] (United States District Court, 2007)

to determine what type of traffic it is looking at, and based on that whether it is infringing or not, and if so it blocks it.

Both of these types of filters have serious problems associated with them. The main problem with the content inspection method is that it cannot distinguish whether the data being transferred is being done so legally or illegally. Under fair use, it would not be illegal to transfer a backup of a CD to a personal server on the Internet for storage purposes. However the filtering system would see that music files are being transferred and block it, effectively preventing a user from carrying out a right guaranteed to him by the copyright law itself. A system like this may even block legal paid downloads of DRM free music files, as these would be indistinguishable from illegal copies. The other problem with content inspection renders it useless from stopping infringement. Currently most P2P networks are unencrypted; however it is possible to implement encryption into all of them. If this was done, it would be essentially impossible for content inspection filters to see the data that is being transferred, and thus they would not be able to stop anything.

Traffic analysis filters have similar problems. As explained above, these types of filters block entire services rather than individual transfers inside services. P2P networks however do have their legitimate uses. For example, many websites distribute their software over P2P networks to save bandwidth, and many other files are shared legally. There are also various other legitimate programs and services that use network technology similar to P2P networks (Skype for example)[34]. These traffic analysis filters therefore may inadvertently block all of this legitimate traffic. On the other side, nearly any network protocol can be used to illegally share files including ones that cannot possibly be blocked (http and ftp for example), and new

[34] (Thomas, 2006)

technology will always be developed to circumvent traffic analysis filters, again rendering them almost useless against piracy.

Despite these flaws with network filters, in October of 2007, StreamCast, the only defendant still standing in the Grokster case, was required by the court to implement a new filtering system into their P2P software "Morpheus," and mentions Audible Magic's acoustical fingerprinting system as one possibility. It appears that the plaintiffs in the case believe that filtering (content inspection in this case) is a viable solution: "First and foremost, Plaintiffs state that StreamCast should be required to incorporate both 'acoustical fingerprint' and 'file hash' technology into a filter. According to evidence submitted by Plaintiffs, other companies claim to have employed this filter duo successfully."[35]

The filtering now required for StreamCast's P2P network will of course only be used on that particular P2P network, not the Internet as a whole. Therefore it won't necessarily impose all the problems with filters described above assuming the filtering is applied to the entire Internet. In June 2007 however, AT&T announced that it would be developing filtering technology for its network.[36] This will be a major technological challenge for it if it is going to work correctly, and from the explanations given by Public Knowledge, et al in their response to NBC Universal's comment, it likely won't. Then in October 2007, AT&T defended their plan, stressing that the consumer must come first, and that whatever filtering solution is implemented, it will be "targeted" and "appropriate under the law."[37]

Dr. Gregory Jackson, Vice President and Chief Information Officer at the University of Chicago, warns against technological solutions to copyright infringement problems. Whatever

[35] (United States District Court, 2007)
[36] (Anderson, 2007)
[37] (Broache, Anti-P2P college bill advances in House, 2007)

the solution, be it network filtering, DRM, or otherwise, determined people will always find a way around it. "When the problems that arise are about personal and organizational behavior, about the rights and responsibilities of community members and citizens, the only successful, robust way to address them is with social rather than technical tools. … When we instead restrict behavior technologically, we get nothing but an arms race we can't win."[38]

DIGITAL RIGHTS MANAGEMENT

When one buys a CD album from a regular retail store, one is able to take advantage of several usage rights that U.S. law grants them. A CD can be played in any CD player, anywhere—in a car, a computer, a home stereo system, or a portable CD player. One can also put the CD into a computer and "rip" the songs on it into digital audio files that are playable by a computer or by a portable digital audio player such as an iPod. What this all means is that after purchasing a single album on a compact disc, a consumer can legally make and own copies of it (whether they're copies of the physical disc, or digital audio files) for their own personal use. In addition, if a consumer somehow becomes bored with an album, he or she can give it or sell it to someone else, also completely legally (assuming they destroy the previously-mentioned personal copies of the CD they are getting rid of, since the rights to own them are lost when possession of the disc is lost.)

The compact disc was available on the market in 1982. Twenty-five years later, in the Internet era, there are new ways of purchasing music. Picture a typical consumer named John. Today, John can go to his home computer, open up the Apple iTunes Store, Microsoft Zune Marketplace, or any of the other countless online music stores, and buy music without ever

[38] (Jackson, 2007)

leaving his home. But is John really getting the same thing that he would have gotten had he purchased a CD of the same exact music, instead?

DRM or Digital Rights Management is a very important concept within the realm of copyright law in the digital age. DRM was mentioned in the background chapter of this paper, but there are several points about DRM that require further investigation. The most concise definition of DRM would probably be "copy protection," but this definition oversimplifies several key issues.

At face value, DRM does exactly what it sounds like it does—it controls usage rights of purchased media (an album in this example.) DRM is specifically engineered to prevent consumers from copying media content the same way they are now able to copy CDs. The vast majority of music that can be purchased online today is DRM-enabled; for example, music purchased from the previously mentioned iTunes store comes branded with Apple's DRM implementation, called FairPlay, while music purchased from the Microsoft Zune Marketplace is branded with Microsoft PlaysForSure DRM.

These companies' DRM schemes are not interoperable. The implications of this can be explained by picturing the aforementioned consumer John once more. John owns a Microsoft Zune, and buys songs for it from the Zune Marketplace. After some months of use, his Zune breaks and he decides that he would like to replace it with an Apple iPod. The problem is that because different DRM schemes are not interoperable, any music that John had previously purchased from the Zune Marketplace will not play on his iPod despite the fact that he's already paid for the music. DRM-enabled media files only play on the computer and device that they were specifically purchased for. This means that DRM-enabled files will play on the computer

they were purchased on, but if these files are burned to a CD, attempts to play the files on the CD in another computer will fail.

This also means that DRM can potentially foster anti-competitive market practices.[39] Because different companies' DRM schemes are not interoperable, they effectively act as barriers that force consumers to purchase digital music from whichever online music store supports their portable digital audio player, preventing consumers from purchasing music from other competing online music stores. The problem is further compounded by the fact that companies which attempt to reverse-engineer each other's DRM schemes in order to support interoperability end up violating the Digital Millennium Copyright Act to do so.

The implications of DRM are hopefully becoming very clear. Opponents of DRM feel that it removes the freedoms and portability that DRM-free media has. An important distinction to note is that in the examples mentioned so far, DRM has only applied to digital (not physical) audio recordings purchased over the Internet with a computer, which is not the only type of media affected by DRM—the relationships between DRM and other types of media will be discussed later in this paper.

DRM-enabled digital audio, however, was not always limited to just the Internet as it is today. The most famous example of this would probably be the 2005 decision that Sony BMG made to add DRM technology to regular physical CDs.[40] Sony decided to add two different DRM technologies to various CDs it sold. One was named XCP (short for "Extended Copy Protection"), and the other was named MediaMax. Both were designed to prevent CDs from being illegally copied using computers. This decision ended up being a complete fiasco for Sony BMG. When inserted into consumers' computers, CDs with XCP or MediaMax technology

[39] (Von Lohmann, 2004)
[40] (BBC News, 2005)

would install software on their computers without notifying the users or asking for their permission for the software to be installed. The software installed a "rootkit" (for the purposes of this paper, a computer virus) that introduced a serious security vulnerability to computers it was installed on. This led to several class-action lawsuits against Sony BMG, which was then forced to recall millions of these CDs (XCP affected 52 different albums while MediaMax affected 50 different albums) and provide either a monetary reimbursement or a DRM-free digital album download to consumers who had purchased the affected CDs.[41]

The 2005 Sony BMG DRM controversy serves as a great example of how DRM can be misused and can fail to achieve its goals, but DRM has other inherent problems. One such problem is the concept of the "analog hole." Today, DRM is explicitly applied to digital media content itself, rather than the devices used to play or retrieve this content. Some portable digital audio players such as the Zune or iPod play music files protected with DRM, and ultimately turn those protected files into sound. Once DRM-protected files are converted to sound, the produced sound itself is no longer protected. There is nothing preventing anyone from connecting a portable digital audio player to a computer sound card or audio recording device using a wire and the player's headphone jack; the audio produced by the player can simply be re-recorded, copied and distributed, although the end product usually is of lower quality than the original recording. This is because this process is a digital-to-analog conversion as opposed to a digital-to-digital conversion [for example, copying a CD onto a cassette tape as opposed to copying a CD directly to another CD using a computer.] In doing this conversion some audio information is lost. Another good analogy to conceptualize this process would be making photocopies of photocopies of a book; with each successive copy, the end result decreases in quality.

[41] (Sony BMG Music Entertainment)

In any case, this ability to copy sound directly is known as the "analog hole." It is quite literally a loophole that is able to directly pierce through the DRM technologies currently being used on the market—no matter how protected a digital audio file is against copying, it will always eventually be decoded into a (copyable) analog audio signal.

Several organizations have proposed ways to "plug the analog hole", or remove this loophole. U.S. legislation designed to combat the analog hole has been introduced, specifically the bill H.R. 4569, better known as the Digital Transition Content Security Act of 2005. This highly controversial bill describes several practices designed to attempt to close the analog hole, at least in the U.S. Here is an example, taken from the text of the bill, Section 201 (b) (1):[42]

> COPY PROHIBITED CONTENT-An analog video input device shall not record or cause the recording of copy prohibited content in digital form, including retention and deletion on a frame-by-frame, minute-by-minute, or megabyte-by-megabyte basis, unless--
>
> (A) the copy prohibited content is retained for a period of not more than 90 minutes from initial receipt of each unit of such content using a bound recording method; and
>
> (B) such content is destroyed or otherwise rendered unusable no later than the end of that 90-minute period.

This is a severe but interesting take on plugging the analog hole, limiting one of the fundamental conveniences of digital media: timeshifting. When adhering to the practices outlined above, instead of watching a recorded video whenever someone saw fit, that person would have 90 minutes to watch the video after it was recorded (and the recording would be destroyed after that time window.)This bill is highly controversial and is upsetting to consumers

[42] (U.S. Library Of Congress, 2005)

as they feel that it infringes upon their fair use rights,[43] but the analog hole is one problem that has so far been unsolvable through the use of DRM.

DRM is not just limited to digital audio, either. It shows up in a wide variety of media, including everything from audio (CDs) and movies (DVDs) to garage door openers.[44] CSS, short for Content Scramble System, is a DRM scheme that is used on nearly all commercially produced DVDs, and has been in use since its inception in 1996.[45] CSS was designed simply to prevent DVDs from being copied, and to prevent unauthorized devices from playing them. The CSS DRM scheme was defeated in October of 1999 by John Lech Johansen,[46] making it possible to use simple computer software to bypass the DRM on the DVD and make a perfect, digital DRM-free copy. Newer DRM schemes, such as AACS (Advanced Access Content System, the DRM scheme used for both next-generation HD-DVD and Blu-Ray movie discs,) have also already suffered a similar fate.[47] John Lech Johansen has even managed to reverse-engineer the aforementioned FairPlay DRM scheme released by Apple (although every time it is compromised, Apple updates the software), writing software that takes FairPlay-branded files and converts then to DRM-free files. In fact, DRM schemes released by Apple, Microsoft and other companies have been defeated and updated numerous times. As DRM technologies evolve, it seems that the people and tools to defeat these technologies evolve with them, and that these technologies will be constantly kept in check.

It's certainly clear that there are many problems with DRM and that there are many reasons why DRM technology may not work so well for today's market. With that fact in mind,

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[43] (Bangeman, "Analog Hole" Legislation Intoduced, 2005)
[44] (Von Lohmann, 2004)
[45] (Barry, 2004)
[46] (Marks, 2005)
[47] (Nicolae, 2006)

are there any other ways to satisfy both consumers and media organizations and companies in regards to rights and usage management? According to an anonymous executive at a major entertainment company that we interviewed, there are several new ideas being researched in the industry. One such idea is 'managed copies.' Basically, managed copies are a special flavor of DRM that allow a certain number of (DRM-enabled) personal copies of certain media to be made. For example, imagine a DVD that would allow itself to be copied 3 times. This technology is actually already available and on the market (the previously-mentioned AACS DRM scheme has this capability,) but the technology has not been widely utilized yet. This may be because the technology needs to be made more convenient; for example, to make a managed copy currently, a device has to uniquely identify a video disc and then connect to an Internet database that tells the device whether that particular disc still allowed to be copied (and if so, then 'removes' one allotted managed copy from the database.) It would be faster and more convenient for a device to recognize how many times a video disc has been copied without an external database, possibly by somehow altering the original disc itself.

The anonymous executive proposed another interesting idea: why bother with physical media at all? The executive told a personal story about shows he had videotaped and never watched. Wouldn't it be interesting to have an Internet-connected set-top box that a consumer could watch any movie from, instantly? Video On Demand is already available from some cable companies, but those services have an extremely limited selection of movies. The executive predicted that the average consumer would grow to love a service where any movie one wanted to view could be watched at any time, all without physical media, provided at a reasonable price. The executive's point was that a lot of the arguments on both sides of the DRM issue would become irrelevant if physical media never entered the picture.

In the music industry, new trends have been surfacing regarding DRM. Historically, music sold digitally at online music stores came branded with one of many DRM technologies, but that is quickly changing. All four major North American record labels (Song BMG, EMI, Universal, and Warner) have started taking steps to digitally sell some of their material without DRM. On February 6th, 2007, Apple CEO Steve Jobs wrote an open letter to the public regarding DRM and the iTunes store entitled "Thoughts on Music."[48] The letter discussed the need for change in the music industry, and certainly seemed to be an impetus for this, because something remarkable happened shortly afterwards. On April 4th, 2007, the record label EMI announced that it would sell high quality DRM-free tracks at the iTunes store (albeit for a slightly higher price than the normal DRM-branded tracks).

Other 'Big Four' record labels then began to follow suit. On August 9, 2007, Universal Music Group announced that they would start selling DRM-free music online (though not through the iTunes store.) On December 27, 2007, Warner Music Group announced that songs from their catalog would be available for purchase as DRM-free digital downloads through the Amazon.com MP3 store. Two weeks later, on January 10, 2008, Sony BMG made a similar announcement; songs from their catalog would also be available for purchase DRM-free through the Amazon.com MP3 store.[49]This was especially welcome news because it meant that as of January 10th, 2008, all four major record groups had started experimenting with distributing their songs without using DRM.

Record groups that have started eliminating DRM are already supplanting it with other newer technologies, such as digital watermarking. As of this writing, Universal and Sony BMG

[48] (Jobs, 2007)
[49] (Sony BMG Music Entertainment, 2008)

both use this technique.[50] This technology allows files to be digitally watermarked with information such as a serial number that an online music retailer or record company could use to identify the original purchaser of the files. This watermark does not interfere with the normal use or copying of these files in any way. If these files were spread around the Internet through piracy channels, it would be possible for a record label to trace the files back to the original person who bought them. This is obviously a very controversial idea.

According to Fred Von Lohmann, an Electronic Frontier Foundation attorney, the use of digital watermarking "gives [record labels] the ability to put pressure on policy makers and ISPs to do filtering."[51] The idea here is that an Internet filter run by an Internet service provider could potentially identify watermarked files and take an appropriate action when they turn up. There are many questions about the use of digital watermarking combined with Internet filtering. Would Internet service providers be responsible to run filters? What action(s) should be taken if and when a filter discovers a watermarked file? The technology is so new that the answers to these questions still remain to be seen.

In any case, it appears that record labels are finally starting to listen to their customers and reevaluate their usage of DRM. It will be interesting to see how the various media industries will approach DRM in the future, how DRM will evolve over time as technology evolves, or if DRM will eventually disappear entirely to give way to mutually beneficial, more accepted alternatives.

[50] (Kravets, 2008)
[51] (Kravets, 2008)

Corporate/OrganizAtional Developments

TECHNOLOGIES THAT ARE BEING USED/RESEARCHED BY COMPANIES TODAY

The major companies and organizations in the entertainment industry have realized that with recent advancements in technology their business has been undoubtedly affected throughout the world. The fact that people simply will not stop illegally downloading music and movies has forced them to take steps towards preventing the piracy themselves. The companies and organizations have several viable options when it comes to trying to stop or at least prevent piracy.

One way that the companies and organizations have begun to execute their plans to reduce the number of pirates is by working with Internet websites that allow the digital files to be downloaded. They are able to do this effectively by monitoring the material that is on the websites by dealing with the site's owners themselves. Although the owners may not be directly responsible for the infringement activities if they do not support it, they still run the risk of being taken to court and prosecuted for allowing the infringement. If infringing material is discovered on these websites then it is likely that the owner may receive a "cease and desist"[52] letter from a copyright holder. With this, the plan is that hopefully some action can be taken to remove work and the copyrights will be protected.

These kinds of websites offer some free sharing for certain files that are posted by their owners. However, many websites also offer legitimate and legal ways to download files that are copyrighted. The companies and organizations in the entertainment industry are working on ways to make downloading a digital file just as cheap and convenient as it is to go out and buy an item. In fact, it may even be easier to obtain digital goods through the Internet nowadays since

[52] (Society, 2008)

more people will have a faster connection. Right now, in the United States only about 20% of household have a broadband connection.[53] This percentage of broadband users is almost certain to increase in the coming years. With more of these legitimate file sharing websites arising and a faster Internet, the easier it will be to buy digital files. This will make people more prone to use them with frequency and a hard copy of a CD or DVD could become obsolete.

Along with these websites, the companies and organizations are working on developing technologies that will prevent users from easily copying and distributing their music in the form of digital files. One major problem occurring is that when people buy a CD or DVD, they may then be able to share it on peer to peer networks with anybody. This would violate copyright laws and is what the entertainment industry is trying to fix. To prevent this, tools such as DRM and filtering our being produced to help reduce the exploitation of file sharing.

DRM and filtering both could significantly help the fight against music and movie piracy. They limit the amount and the content of files that people may wish to copy and share. The problem with these technologies is that they restrict a legitimate user from being able to perform activities that may look illegal to the system but actually are not. This hindrance acts against the rights of fair use and limits number of times a user can to copy their product for personal uses. Critics of this technology say "the music companies should stop treating their customers as would-be crooks".[54] For this reason, many technology companies are trying to figure a way to detect infringers without restricting a legal user.

One new technology that is being attempted is fingerprinting of digital files. Fingerprinting of digital files would allow for any file to be recognized just by a simple code that would be stored in it somewhere. This way, copyrighted works can easily be identified on file

[53] (IP Manager for Entertainment Company, 2007)
[54] (Bray, 2003)

sharing networks or the copyrighted works could be banned completely. This seems like a reasonable and feasible idea to most people in the industry. One problem with fingerprinting is that there will always be hackers to the system who can figure out how to change a code or block it from being seen. Ideally, this would only be a limited number of people who can alter the codes on copyrighted material, so this technology does seem to have a future. RIAA has been reported to be looking for a way to put fingerprinting trackers into anti-virus technology. Again this would only work if the file has some sort of tag on it and it wasn't able to be changed. The RIAA also has to be careful that it do not break any laws if it implemented this technology. The technology is somewhat intrusive and could be considered invasion of private property rights.[55] For now, it seems to be the direction that most technology companies are heading.

Another technology that is way ahead of its time would require for a user's DVD or CD player to have a distinct code. When the user buys a CD or DVD the disc or digital file would then be changed in some way so that it could only be played in the user's device.[56] This extremely limits the rights of fair use and does not seem plausible at all. The goal of such a practice would indeed limit copyright infringement, but it seems too restricting and needs a way so that it would not constrict the user's applications so much.

The entertainment industry has been working with many different technology companies to try and come up with a way to block copyright infringers. We heard from one source of a company called Audible Magic[57] which "provides innovative electronic media identification and copyright management solutions."[58] Although the entertainment industry is being hurt from this

[55] (Driver, 2008)
[56] (Silva, 2004)
[57] (IP Manager for Entertainment Company, 2007)
[58] (Audible Magic, 2007)

surge of infringers, the technology companies are keeping busy just trying to keep up with new advancements of the world.

PRACTICES/ACTION TAKEN AGAINST PIRACY

The companies and organizations involved with trying to prevent piracy realize that they cannot do it all by themselves. They need help from the government and the common person to help hinder piracy. The more that people begin to realize how damaging the copying of music and movies is to the industry, the less likely they will be to break the law. As for now, the industry has to work with the government on making new legislation that could prohibit file sharing over networks and possibly have law enforcement take action against pirates rather than the companies and organizations having to bring up lawsuits on infringers. They also have to work with Internet users and help educate them on what is wrong and right. According to the RIAA President Cary Sherman, "there'd be less piracy if users simply knew what they were doing was illegal."[59] One reason some people don't realize that file sharing is so detrimental is because it is so easy and accessible. So many people download music and movies without even thinking about the consequences and as the director of communications from the MPAA said, "It's hard to compete with free."[60] So the entertainment industry feels that it has to get the support of the public to stop pirating. These are the common practices that the industry would like to improve on to restrict copyright infringers.

In order for the government to make a difference in the fight against piracy, it would first have to find some way to strengthen the copyright laws so that if an infringing website could be taken down immediately without a fight. The government should also be responsible for

[59] (Vilches, 2008)
[60] (Kaltman, 2007)

enforcing the copyright law against individuals who have violated it. The system in order now has the companies and organizations filing law suits against individuals or websites which they believe have violated the law. If there were stronger legislation in place that clearly defined what qualifies as fair use and what is illegal, then the industry wouldn't even have to file lawsuits. The government and law enforcement could pursue and punish any users committing illegal actions. The government has copyright laws in place, but it is up to the copyright holder to protect their work. For now the laws and enforcement of them is frail, so it is a problem that will persist.

Another practice that will help prevent copyright infringement is educating the public. The more people know about the copyright law and the consequences that can come from breaking it, the less likely it is for them to abuse it. The companies and organizations are trying ideas like "short films in movie theaters" before the feature film and "educational outreaches" to schools and universities.[61] The main goal is just to create an overall awareness to the general public and the hope is that the world is full of mostly law-abiding citizens.

ISP RESPONSIBILITY FOR ANTI-PIRACY MEASURES

Another major concern for the entertainment industry is the availability that ISPs (Internet Service Providers) allow for such peer to peer networks and mass file sharing. An ISP is a "gateway between you and the Internet"[62] which allows for all the actions that a person may take on the Internet. The ISPs currently do not do anything to try and prevent the illegal file sharing over their network. The companies and organizations in entertainment have tried to work with the ISPs to form some type of filter, but the ISPs have been reluctant. However, the

[61] (IP Manager for Entertainment Company, 2007)
[62] (Honan, 2008)

entertainment industry is still trying to form some type of partnership with the ISPs to try and help reduce the amount of illegal downloading over the Internet.

It has been ruled in the past, in the Digital Millennium Copyright Act of 1998, that ISPs are not responsible for file sharing that may occur over their network. ISPs are responsible for making sure that copyrighted works are eliminated from Internet websites if they do appear but cannot be held responsible for information that is passed through the network. As long as the ISPs do not receive financial gain from it and do not condone it, then they are not held liable. The ISPs are offering a legitimate technology that can be used in many different circumstances other than just illegal downloading. As long as the Internet can be used for a justifiable cause then, it cannot be blamed for people that abuse it and commit illegal actions on it.

Many different organizations want to work with ISPs to create a system that might be able to prevent piracy. One idea is to have filters that can detect if material is copyrighted and prevents it from being distributed. This poses some problems as it may obstruct a user from getting works that should be open to the public. Also, the filters when implemented would make the delivery to the user slower because the network is checking for illegal downloads. However, with fewer peer to peer networks, the Internet may work better because the network would not be clogged by users downloading files.[63] There are many advantages and disadvantages when using filters.

The ISP's do have to be careful that they do not interfere with the law if they ever do implement any anti-piracy measures. Technologies like filtering could be considered a selective process and the ISP's could be charged with data discrimination. The filtering could even go against the Federal Wiretap Act if it is said that the Internet messages are considered the same as

[63] (Honan, 2008)

a telephone call. One way to get around all of this would be by putting a statement in their terms of agreement with the user.[64] If the ISP's do decide to filter, they just have to be careful and go about it the right way.

One lawmaker from California is trying to pass a bill that will force the ISPs to send a warning message if someone is to access pirated materials over the Internet. Right now, the ISPs are not obligated to take any actions against pirates but some do send an initial warning stating what is right and what is wrong. This is probably the safest way to start fighting against pirates because it will keep the honest user from committing illegal actions but will also give them access to whatever they need.

With technologies becoming faster and easier to use, more pirating is likely to occur. The companies and organizations in the entertainment industry are trying to deter people from pirating copyrighted works before the situation gets even worse with even better technologies. However, the temptation to illegally download is there and may never be completely eradicated.

Current Policy Issues

UNIVERSITY RESPONSIBILITY FOR ANTI-PIRACY MEASURES

Not unlike the debate about the responsibility of Internet service providers to implement anti-piracy measures on their networks, a similar debate has recently surfaced regarding the responsibilities of colleges and universities to implement anti-piracy measures on their respective networks.

Colleges typically provide students with computer network connections both inside and outside of student dorms, essentially acting as Internet service providers (or ISPs for short) for their students. It then makes sense that on the surface, this issue raises many of the same

[64] (Reed, 2008)

questions that the previously discussed Internet service provider (henceforth referred to as ISP) issue does.

Many have argued that the average college student engages actively in the piracy of movies, music, or other digital media, taking advantage of the fact that a student is surrounded by other students that possess and are willing to share digital media through their college's computer network. This piracy problem is further compounded by the fact that files need not be exchanged over the public Internet, but that piracy can occur inside a college's own closed, private network. Is it a college's responsibility to monitor for piracy on their network? What disciplinary and/or legal actions should colleges take against students in the event that they catch students engaging in digital piracy?

There are several pieces of U.S. legislation pending congressional action that aim to address some of these questions and issues. One such example is the College Opportunity and Affordability Act of 2007 (H.R. 4137). California U.S. representative George Miller introduced this bill to Congress on November 9th, 2007. As of this writing, the bill has been passed by the U.S. House of Representatives with a very clear 354 to 58 vote (17 did not vote), and the bill has yet to be voted on by the U.S. Senate. Should it be signed into law, this bill would amend and extend the Higher Education Act of 1965, revising and reauthorizing various programs mostly related to funding and cost regulations for U.S. colleges.[65]

Section 495A of this 1051-section-large bill is entitled "Campus-Based Digital Theft Protection". It contains two subsections. One section mandates that applicable institutions "make publicly available to their students and employees, the policies and procedures related to the illegal downloading and distribution of copyrighted material." It also mandates that they

[65] (GovTrack.us, 2008)

"develop a plan for offering alternatives to illegal downloading or peer-to-peer distribution of intellectual property as well as a plan to explore technology-based deterrents to prevent such illegal activity."[66] Another subsection discusses the awarding of grants to institutions "[in order] to reduce and eliminate the illegal downloading and distribution of intellectual property."

These ideas seem innocent enough at the first inspection, but they have been extremely controversial, as they would place many difficult and costly responsibilities on colleges. "Alternatives to illegal downloading" might mean that colleges would have to provide a subscription-based media downloading service to students. Educase, a nonprofit association "whose mission is to advance higher education by promoting the intelligent use of information technology," is lobbying to get parts of section 495A of the bill removed. Mark A. Luker, a vice president of Educase, stated that "colleges have found that their students don't want to use or pay for the subscription-based music services," and that "technology tools to deter copyright infringement are expensive and do not work."[67] Educause's director of policy and networking programs, Steve Worona, stated that "[Educase] reject[s] the contention that campuses play a disproportionate role in the file-sharing problem. The requirements of the legislation will increase tuition costs and provide no value."[68] Another issue with this section of the bill is that no clear penalties for noncompliance are stated, worrying college administrators. Meanwhile, organizations such as the MPAA have applauded the bill: "We are pleased to see that Congress is taking this step to help keep our economy strong by protecting copyrighted material on college campuses," stated MPAA CEO Dan Glickman.[69]A bill with a strikingly similar section, the

[66] (GovTrack.us, 2008)
[67] (Foster, 2008)
[68] (Broache, House approves MPAA-backed college antipiracy rules, 2008)
[69] (Broache, House approves MPAA-backed college antipiracy rules, 2008)

College Access and Opportunity Act of 2007 (H.R. 3746) was introduced to Congress on October 4, 2007 by California U.S. representative Howard McKeon.

H.R. 4137 is not the only piece of legislation relevant to this issue, however. The Curb Illegal Downloading on College Campuses Act of 2007 (H.R. 1689) was introduced to Congress by Florida U.S. Representative Ric Keller on March 26th, 2007.[70] The bill was written "to provide support to combat illegal downloading on college and university campuses." The bill asserts that copyright violations and piracy are a major issue on university campuses, that students participating in the act of piracy compromise university computer systems and create excessive computer maintenance costs. The bill also states that "programs can be developed that will stop illegal downloading while still maintaining student privacy and academic freedom."[71] Like H.R. 4137, this bill would also amend the Higher Education Act of 1965. This bill also seems less controversial than H.R. 4137, as it would support "efforts to establish pilot programs and initiatives to help offset the costs associated with implementing model programs and policies on college campuses to reduce illegal downloading of copyrighted content in order to improve the security and integrity of campus computer networks; and save telecommunications bandwidth costs, while ensuring such bandwidth is first and foremost made available for research and education-related purposes."[72]

The degree of responsibility that colleges and universities should have to monitor and take action against students participating in digital piracy still remains to be seen, but it should be overwhelmingly clear that this is an extremely debated issue that changes on a very frequent basis. Right now, institutions are mostly left to their own devices to monitor and/or punish

[70] (GovTrack.us, 2008)
[71] (GovTrack.us, 2008)
[72] (GovTrack.us, 2008)

students involved in digital piracy, or to be the middleman in any potential lawsuits against copyright infringers, but with the amount of legislation regarding this issue that is circulating around Congress, hopefully there will soon be more answers than questions.

Economic Developments

DOMESTIC VS. FOREIGN IMPACT ON PIRACY

At first glance, it is easy to understand the views of entertainment organizations who say that illegal downloading is costing them billions of dollars. According to the MPAA, the movie industry lost more than 7 billion dollars to Internet piracy alone.[73] The illegal downloading also does more than just effect the industry; it is also hurting the U.S. economy as a whole. It has been reported that piracy costs the U.S. 60 billion dollars a year and almost 400,000 jobs lost a year in the U.S.[74] Many surveys have been conducted by members of the MPAA and other industry organizations to prove this point. There are numerous artists and musicians who say that this increase in pirated music is affecting the industry as well. These artists see that it doesn't only affect them, but everyone around them. Artist, Steven Chapman, explains this by saying,

> The price of a CD doesn't just go back to the record company. Everyone who works with me to record and distribute my music makes a living and supports their families from CD sales as well. It's a big network of people from my co-producer, the engineers, my band all the way to assembly line people who help to manufacture the CDs and the truck drivers who get them to the stores.[75]

A simple 99 cent song to a consumer who could get it for free does not seem like a whole lot, but to people in the entertainment industry it is everything. Not everyone in the music industry is

[73] (Kaltman, 2007)
[74] (Mills, 2007)
[75] (Millions of Wrongs - Music Piracy, 2008)

living a rich and glamorous life. Some artists are working hard to make their music but do not see any profits from it if their works are not being bought.

However, there have also been studies that show the illegal downloading of music may not hurt the industry as previously thought. Although piracy creates tremendous losses for the entertainment industry, it has also created a more prosperous market in other areas. For instance, it is common for a person to maybe download a song and sample a certain artist to see if it may be worth buying the CD. In a study done by researchers from Harvard Business School and University of North Carolina, it was found that an increase in downloads did not hurt the sales of CD's. They said that,

> The most heavily downloaded songs showed no decrease in CD sales as a result of increasing downloads. In fact, albums that sold more than 600,000 copies during this period appeared to sell better when downloaded more heavily.[76]

The increase of downloads in recent years has given movies and music unintended exposure. This exposure in the long run could help benefit their sales at the stores and at the ticket booths as well. When numbers come out showing how much the entertainment industry has lost due to illegal downloads, they usually fail to show how much they have gained from these downloads.

Pirates of music and movies can not alone be blamed for decrease sales in recent years. They can be liable for a fraction of the loss in sales but there are many other factors that have to be considered as well. Since 9/11/2001, the U.S. economy has not been the same and people have been watching their money a little closer. This has shown to also be hurting the sales of the industry. Also, the price of a CD is not getting any cheaper. The price of a CD keeps rising as the

[76] (Knight, 2004)

materials need to make and produce them grows.[77] There are other ways that the industry can be stolen from as well.

The industry seems to be extremely worried about Internet piracy when it should be more worried about the amount of money lost to bootlegging and illegal copying of hard goods. The MPAA reports that they lost over 11 billion dollars due to hard goods being pirated which outweighs the 7 billion dollars lost to Internet piracy.[78] The RIAA says that they lose 300 million dollars a year to hard goods being pirated, but they do not have any statistics for how much they lose towards Internet piracy.[79] From these numbers alone it can be concluded that hard goods being pirated pose a bigger threat to the industry than the digital goods being pirated. The entertainment industry should be focused on solving other problems besides illegal downloading right now. The focus on illegal downloading is more than it should be and this was best said in an article by Eric Bangeman when he said,

> Studies that overstate the economic effect of piracy do little to further the discussion over issues of copyright, file-sharing, and DRM, and they obscure the fact that the music industry still has some serious work to do on its business model.[80]

The RIAA and other industry organizations have been pursuing the illegal downloader for quite some time now. They have tried to blame the Internet providers for people illegally using their service, but the courts have ruled that they are not to blame. Since this ruling, individual pirates have been the target of industry leaders. Over 2,000 individuals[81] have been sued by the RIAA since 2004. A first time offense can lead up to five years in prison and 250,000 dollars in fines. Most people take a settlement for a few thousand dollars in these

[77] (Knight, 2004)
[78] (Kaltman, 2007)
[79] (For Students Doing Reports, 2008)
[80] (Bangeman, A $13 Billion Dollar Fantasy: Latest Music Piracy Study, 2007)
[81] (Borland, New RIAA file-swapping suits filed, 2004)

lawsuits.[82] The plan of the RIAA seems to be, if they can stop the major pirates, it might thwart the average pirate from illegally downloading as well.

The fight against piracy is not only in the United States, it is a worldwide problem as well. With technology advancing around the world, the threat of even more Internet piracy looms ahead. Countries like Philippines have been increasing their broadband availability rapidly within recent years. In 2005, the Philippines broadband access grew by over 100% allowing for more possible pirates to have the capabilities needed to download illegally.[83]

Many foreign countries are trying to keep control over the copyright law just like the United States is. China for example has recently put forth a major effort to try and reduce the number of pirates in their country. Just this past year, China shut down 339 illegal websites and confiscated 123 servers. They also enforced a total of over $120,000US in fines to violators of the copyright law.[84] China did have a major problem when it came to Internet piracy in the past, but now they seem to be headed in the right direction to protecting copyrights.

Other news of foreign impact on the fight of Internet piracy comes from Sweden. The Swedish Performing Rights Society has recently been trying to work with ISP's to work out an agreement where they could charge the customer for downloading music and movies. The Society believes that the ISP's should be able to charge a small portion towards the user's bill to compensate for downloads. This way the ISP's would be a lot like a radio station where they pay to be able to broadcast the music.[85] This is just one of the ways the rest of the world is trying to catch up in the economic losses caused by Internet piracy.

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[82] (Borland, New RIAA file-swapping suits filed, 2004)
[83] (Daquiz, 2007)
[84] (Hongjiang, 2008)
[85] (O'Mahony, 2008)

Another report coming out of Sweden was made by a file sharing website called The Pirate Bay. This website is a large source for free downloads which at one point had been shut down by Swedish officials. The company moved to the Netherlands for sometime after moving back to Sweden and starting up again. Now faced with pressure from the government and the rest of the world, The Pirate Bay is actually looking into buying its own island so that it can have its own copyright laws and not be under the jurisdiction of any government. The island, Sealand, is in the North Sea and would be a pirate's playground. The site's owners said, "It should be a great place for everybody, with high-speed Internet access, no copyright laws and VIP account to The Pirate Bay."[86] This may be a solution for the website, but it has yet to be seen if their goal can actually be created and accomplished.

Piracy has not been completely detrimental to the economy. The recent growth in Internet piracy has also caused an influx of information technology (IT) workers throughout the world. In a report from Business Software Alliance, it is stated that by 2011 there will be 3.5 million IT jobs in China alone.[87] The loss of jobs in the entertainment industry makes for more jobs in the IT business. It is also projected that countries will be spending a lot more money on IT equipment to try and prevent piracy. In the end, the entire world's economy could end up benefitting from piracy.

The advancements in technology that allow for illegal downloading have also opened up new avenues for companies to sell their products. Movies and songs can now be bought legally over the Internet for a fair price. The Apple Corporation has opened up a whole iTunes store which sells individual songs for 99 cents and a whole album, regardless of the number of songs,

[86] (Savage, 2007)
[87] (Tan, 2008)

for only $9.99. If it is a new release they may sell it for a more, but still at a reasonable price.[88] Today, more and more of these digital media stores are opening up online creating more ways for consumers to buy the products they want legally. Other examples of digital stores can be found at walmart.com or on Amazon.com. With more stores available, the competition between them will promote balanced prices for consumers.

Companies are also looking into other ways[89] to make profit off of these new advancements in technology. Someday the hope is that the consumer may be able to purchase a song through the radio and all movies can be purchased through a cable provider. These are all possible ways that the industry can still make money from the products and provide an easy way to transfer it to their consumer.

In the end, the entertainment industry does lose money due to illegal downloading, but they also gain profits from it as well. The industry also has other ways that it can make money from this inflation of downloading in recent years. There are many problems that are affecting the entertainment industry and they all must be corrected to sustain maximum profit; the problem is not solely illegal downloading.

Public Education on Relevant Issues

One thing that is clear is that the public needs to be educated about copyright law and the related issues going on today. Organizations such as the RIAA and MPAA hope that by educating the public, they will be able to reduce the amount of piracy. Other organizations, such as Public Knowledge and the Electronic Frontier Foundation hope that by educating the public,

[88] (Speaking of Music Piracy..., 2008)
[89] (Marks, 2005)

people will be more aware of their rights and the various steps being taken by industry and government to try to limit these rights in favor of rewarding copyright holders.

In an effort to help stop music file sharing over university campus networks and the Internet, the RIAA released a video targeted at college students about the consequences of free file sharing and copying. The video explains that almost all cases of free file sharing are illegal, and that there are various legal alternatives one can pursue. Most of the video however, rather than really educating the viewer and explaining why it is wrong, simply details the possible consequences of engaging in such activity. These consequences include, but are not limited to, arrest, legal fees, settlement costs, jail time, expulsion from school, and computer viruses from the file sharing networks and websites. It is clear that the point of this video is to scare young people away from illegal file sharing.[90] In response to this video, Consumer Electronics Association and Public Knowledge, among others, issued a statement claiming that the video misrepresents consumers' rights.[91]

The MPAA has done similar things to the RIAA regarding public education. In 2003, the organization Junior Achievement in association with the MPAA created a program "designed to teach middle grades students responsible 'digital citizenship' and educate them about the importance of respecting copyrights and not engaging in illegally downloading or swapping protected materials on the Internet." [92] Unlike the video from the RIAA designed just to instill fear, this program attempted to teach the ethical issues behind file sharing.

Microsoft also is currently taking a similar approach to the MPAA regarding middle school education. Microsoft recently surveyed 500 7th through 10th grade students about

[90] (RIAA, 2006)
[91] (Read, 2006)
[92] (Junior Achievement, 2003)

intellectual property law and file sharing, and found that almost half were unfamiliar with the laws and the fact that most Internet file sharing is illegal. In response, Microsoft is developing a program for middle and high school students that will give teachers access to lesson plans and case studies for teaching students about intellectual property laws and file sharing.[93]

Also in 2003, the MPAA launched an ad campaign showing on 35 TV networks and 5,000 theaters in the US. The MPAA thought that many people believed sharing movies to be a victimless crime because the only people who would get hurt were the millionaire actors and directors. The point of this ad campaign was to show people that illegally sharing movies actually is not a victimless crime, because it doesn't only affect the actors, but the regular people who work on movies too, like the costume designers, set painters, camera men, etc.[94]

The organization Public Knowledge works to defend the rights of the public "in the emerging digital culture."[95] They follow many of the current issues that pose threats to consumer rights, many copyright related, and work toward preventing these threats. All of these issues, what they are about, and what Public Knowledge is doing about them can be found on their website, thus providing a source of education for the public on these issues.[96] The more that the public is aware of these issues and the threats that their rights are facing, the harder it will be for these rights to be taken away.

[93] (Sullivan, 2008)
[94] (Woolman, 2003)
[95] (Public Knowledge, 2007)
[96] (Public Knowledge, 2007)

Recommendations

DISTRIBUTION METHODS

In an age when new technological developments are introduced on a daily basis, we recommend that media companies actively research and implement alternate distribution methods for auditory and visual digital media. Doing so would have positive effects on the industry as a whole for both consumers and media companies.

Current digital distribution models involve a consumer paying money to receive physical media such as a CD or DVD, or to receive digital media files that can be downloaded by using a computer. This model, as ubiquitously accepted as it currently is, may not be the best approach. Allowing consumers to access physical media not only introduces avenues for piracy, but may also be completely unnecessary an age where almost anyone can afford a computer. (It's true that if one can afford to buy a computer, one can certainly afford to buy physical digital media legally. However, the act of downloading or pirating copyrighted material transferred from physical media is much easier and much less risky than the act of stealing a computer.)

Instead of selling physical media, relevant industries may want to research alternate distribution methods. One such method could involve a subscription-based service that sells a comprehensive catalog of auditory and visual digital media. When a consumer makes a purchase from the service, the consumer owns the rights to view or listen to that media through the service whenever they wish. Media could be directly streamed over the Internet to a computer for viewing or listening at any time. It would also be possible to transfer media to a portable player, but not to save it on a computer as files that can be manipulated by the consumer (it can only be streamed.) This would vastly increase the difficulty of illegally [re]distributing the media.

This service could potentially be much cheaper than the current media distribution models for both consumers and media industries, as the cost of producing physical media would not be incurred. These reduced production costs would enable distribution companies to continue to pay royalties to artists while most likely reducing costs to consumers.

This service would differ from similar currently available services because it would be both cheaper (a low flat monthly fee might suffice) and have a virtually unlimited catalog of both audio and video recordings. These factors of cost and media availability have the potential to permanently alter the way media is distributed.

COPYRIGHT LAW

Another recommendation that we must make involves a change to the copyright law itself. The Digital Millennium Copyright Act of 1998 added a new section to Title 17 about "Circumvention of copyright protection systems." The first sentence states that "no person shall circumvent a technological measure that effectively controls access to a work protected under this title."[97] This makes illegal not copyright infringement, but simply removing protections that are in place that attempt to control access to copyrighted works. A prime example of a copyright protection system is DRM as described previously. Thus, removing the DRM protection from a digital media file, for instance, is illegal. One serious implication of this is that the exceptions and limitations that typically apply to copyright law, fair use for example, cannot apply, because circumvention is not actually infringement. Normally fair use would allow one to make a backup copy of copyrighted material such as a video DVD, music CD, computer software, etc. DRM systems however can make this impossible because they can prevent copies from being made. Therefore if one desires to make a backup copy of a DRM protected DVD for example,

[97] (17 USC Sec 1201, 1998)

one must first circumvent the DRM protection. Unfortunately the anti-circumvention law makes this illegal, even though it is done for a non-infringing use that is protected by fair use. The end result is that anti-circumvention can effectively remove some fair use rights, giving copyright holders more power over their copyrights than should otherwise be allowed.[98] [99]

Our recommendation is that the use of DRM systems be dropped. Fortunately this is already beginning to happen, with DRM free songs available from the major record labels at both the iTunes music store and Amazon.com. In addition however, there must also be some protection for consumers in the law. We recommend that the anti-circumvention law be modified to allow for exceptions in all cases when the circumvention is done to perform a non-infringing action which would otherwise be impossible. This needs to be done to protect the exceptions and limitations, especially fair use, detailed in the copyright law.

PUBLIC PERCEPTION

A key way to help reduce and prevent wide-spread illegal downloading throughout the world is by educating the public. It seems that no matter who is talked to and what their views may be on piracy, they always end up saying that if the public is educated on the right path to take, then they will do it. The main goal to prevent copyright infringers is to "keep honest people honest."[100] The problem with illegal downloading is that it is just so easy and many people don't even think of the ramifications when they are doing it. One way to lessen the damage is to make legal distribution easier and the other is to make sure people realize how damaging the illegal downloading can be. Many organizations that are fighting piracy realize that building public

[98] (Public Knowledge, 2007)
[99] (Chilling Effects Clearinghouse)
[100] (IP Manager for Entertainment Company, 2007)

knowledge and awareness is important and they have begun programs around the world to help educate people about Internet piracy. As a strong recommendation in this report we feel that educating the public will decrease the amount of copyright infringement over the Internet.

It is more than apparent that many Internet users do not know what they are doing when illegally downloading a digital file. Many people are just not familiar with the technologies and do not understand the devastating results that are created when downloading a digital file. The fact that downloading a free digital file is so much easier than maybe a paid file that has some confusing restrictions on it, makes it seem like an easy choice to the consumer. In this case, the easy choice is not the honest and law-abiding option.

To help decrease the amount of Internet piracy in the world, Internet users need to be educated on how to use the technology and what the right uses for it are. The only reasonable way to start teaching people seems be by starting at the schools. If the children are taught at a young age what is right and wrong, most of them should choose the lawful path. The students can also be taught on the proper way to use the technology. They can be taught that buying a song and copying it for all their friends is not fair to the music industry. Almost half of the students in schools today are not familiar with the copyright laws.[101] This is the major problem that needs to be fixed and the education curriculum can help this. By adding in curriculum on copyright laws and digital piracy the students will be able to learn how harmful it can be to commit such illegal actions. It will help them realize that pirating is just as morally wrong as stealing a bike.[102] Teaching children legitimate ways to download music and movies will be a big step forward for the future of the entertainment industry. This solution is not a quick fix and will

[101] (Sullivan, 2008)
[102] **Invalid source specified.**

take a lot of time, but in the long run the positive effects that come out of it for the entertainment industry could be extraordinary.

This plan to teach children is already in progress by some entertainment organizations. The MPAA has been trying to reach out to students in between the fifth and ninth grades.[103] Although, the MPAA may be scaring the students away from downloading digital media at all with lawsuits and exaggerated numbers of financial losses, they are headed in the right direction. As long as the students are taught what the law actually says, then there may be some fair progress in educating them on the right way to download music and movies.

Another way that the entertainment industry can educate the public is by running a massive commercial campaign. This can be done in a variety of ways which includes on television, on the Internet, in stores, in magazines, and a mailings in which ads would be sent out to large numbers of people. The MPAA has tried showing short films in theaters before the actual movie is shown to get their message to pirates and the public.[104] The more that the entertainment industry advertises their problem, the more the downloader might care about them. Microsoft has created a website called "My Bytes" where it allows the user to record and listen to their own music and helps the users receive experience with their own intellectual property and the rights that go along with it. This site is targeted toward teenagers and does have a lot of good information than can be helpful to teaching them their rights and the rights of others.[105] Any advertisement that reaches out to the public can only help the fight against piracy.

Another effective way to help thwart pirates would be to send a message to the downloader when it is suspected that he or she is downloading something illegally. This notice

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[103] **Invalid source specified.**
[104] **Invalid source specified.**
[105] (Vilches, 2008)

must be short so that the user actually reads it, but still appear in a way that the users are not allowed to download until it is sure that they have read the warning message. This method would only be effective if the users actually read the message and it wasn't in some sort of long agreement statement.

All of these public education tools discussed could be part of the long term solution against piracy. Raising public awareness will allow unknowledgeable Internet user to become more familiar with the technology they are using and the consequences that follow when they download illegally. A strong effort to educate the public can keep people truthful and this will hopefully decrease the number of pirates on the Internet.

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