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Copyright and Software

Ever since the introduction of file sharing and the existence of copyrighted digital products there has been a complex interaction between copyright and software. There has been much software created with the intention of file sharing and to promote efficiency and distrubtion easiness for the users, like peer to peer (p2p) sharing software. On the other hand, because of the effects of the digitalization of intellectial property, "digital locks",such as DRM softwares, have been introduced to limit the distribution and replication of digital products and software.   At the same time, those controversial softwares have caused a large conversation on analyzing the purpose of digital products and the rights of the user to their software.

In the 70's, some universities and companies created a local network to transfer files internally; however, the technology at that time limited the ability of transferring a large file through the network. Since the activity only existed in a fairly small and controllable environment, the chances of facilitating the copyright were very small. As more people benefited from the idea of transferring files remotely through network, this one-to-one file sharing style gained more popularity in the community. Many software were developed during that time to serve as file sharing tools. Consequently, the introduction of Napster, one of the Peer sharing software (often labeled p2p), marked the golden age of the peer to peer technology.

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We had less argument about copyrights back in the old days compares to today. Since the 70's one-to-one file-sharing activity only involves one sender and one receiver, where the receiver knew what files were expected and where they came from. In addition to the file sharing activities only exists internally, it was less likely to share files with "outsiders" who did not know anything about the source of the files. Conversely, peer to peer technology dedicated on the speed efficiency of transferring large size files from anyone to anyone through internet; therefore, anybody from anywhere could download those files and less likely known who owned the licenses of them. There exists confusion for people who wish to download files legally, because the many files uploaded online contain little to no information about the distributors, licenses and liabilities. By excluding the people who intend to download and reproduce the files illegally, legitimate users don't have to suspect such files are unacceptable to receive because they are listed over there and meant to be sharing without obligation.

Before we discuss how the exploiting of copyrights is made, we have to clarify the mechanism of p2p software that misdirects users to make such assumptions. A quote from J.A. Pouwelse's paper defined the characteristic of BitTorrent. He states, "BitTorrent does not provide a file-search mechanism itself; instead, users have to go to websites which act as central directories listing recently released files"(Pouwelse ,3). BitTorrent users need to search the corresponded index file, which is a pointer to the actual file, to retrieve the real file they wish to download. It's also known as BitTorrent's seed file, which size is usually small and the BitTorrent itself will help the user join a group of users who are currently queuing/downloading the same exact file. Simply by looking the

seed file itself, there is no way to determine what file is being shared online unless the name of the seed file is clearly stated (usually the seed file name is made of random strings). If user can't determine what they are downloading, it's even more difficult for them to judge what files are shared legally. This confusion creates a gray zone which makes the legal publisher of such files couldn't take immediate action to the illegal activities.

Convenience, easy access and fast speed are the key factors that make software like BitTorrent and Napster successful; nevertheless, we have to realize that the best advantage of using p2p file sharing software(Bittorrent, in this case) over regular HTTP/FTP download is the completeness of that file(no need to worry about file corruption). The original motivation of software like BitTorrent is not to provide an anonymous environment for users to download so that the publisher couldn't able to track and punish the illegal activities. During this pirating activity, the legal publisher is losing huge profit as BitTorrent hosts tremendous illegal files on the internet for users to download. Probably we can ask a simple question to this issue. Who is exploiting the copyright constraints? Gabriel Alatorre points out the teenagers, who are influenced by the convenient technology, are the major users that infringement copyrights law. He states that, "Peer to peer (P2P) downloads are on the rise, especially amongst teenagers. A study conducted by Juniper Research found that 34% of the 15-24 age group admitted to sharing music online without paying for it" (Alatorre,1)-- Nothing is more appealing than free downloads on internet for those teenagers. A good example to explain this phenomena is Napster, a p2p orientated software, led a revolutionary music sharing

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service in 1999. Since teenagers are one of the biggest groups of customers on the media industry, Napster served them a music store that they could download the entire albums for free. As a result, the media industry is suffering tremendous impacts on their seasonal incomes. Since Napster has in-built search engine, the U.S. users could access Asian music that they may not able to get from local record store. As a result, in some countries that have less emphasis and enforcement on copyrights protection, many record companies and stores have faced closure—and most of the victims among them are the well-known ones back in the old days.

Many relevant companies, who survived from the impact of p2p caused copyright infringement, accuse the software that functioning like BitTorrent is the responsible one that needs to be banned; however, they are not completely true. The debates between media industry and BitTorrent become intensive as more people joining in the peer-to-peer network and downloading media products for free. There are numerous evidences with data supporting their claims, as Sanjay Goel stated in his paper, "The music industry holds P2P file-sharing systems responsible for a 25% decline in music sales after 1999…" (Goel,1). Interestingly, Napster appeared on the internet and became popular in the same year, such coincident reveals the rate of impact on legitment music market and exposes the controversy of using P2P on the internet without proper supervision. However, the designers of BitTorrent do not think they are guilty, rather innocent on this copyright controversy. The company claims that BitTorrent is a open-source software, and it only provides a platform for user to share files. The mechanism of BitTorrent software defines its neutral property on the doubt of violating copyrights law. The

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BitTorrent server only stores the index files and the actual file that causes copyright infringement is stored on user's computer, it's impossible for the company to receive revenue from this service. It seems less convincing to accuse BitTorrent is the software that devastated the media industry, since the outcome of impacts is differentiated by people who have different intentions. Ironically, some evidences even indicate that P2P network has nothing to do with the blame of copyrights violations. "[The] RIAA reported a 10.3 percent and a 7 percent drop in total US music shipments in 2001 to 2002 respectively" (Goel,4). The statement shows the percentage of decreasing music sales doesn't proportion to the increasing usage on p2p file-sharing. It's said that software like Napster provides a full-length preview on music products which helps record company to advertise their products—for free. As a result, media industry has to develop a new technology to prevent any marginal activities that possibly impact the copyrights.

Copyright holders have found that much of their works and data have been distributed extensively without their consent, losing much potential revenue. In order to combat this blatant piracy, engineers have developed software integrated into distributed digital copyrighted works, called digital rights management software (DRM), that aims to reduce the ability for users to distribute unauthorized copyrighted data. Ever since the introduction of DRM, there has been great debate over its positive and negative effects on society   and   the   internet.

In 1998, the Digital Millennium Copyright Act (DMCA) was passed in the United States. The law made it illegal to create software designed to circumvent DRM. Specifically " primarily designed or produced to circumvent, ...have only limited

commercially signifcant purpose or use other than to circumvent... or marketed for the us in circumventing"(DMCA, 4). Its significance on copyright law and file sharing was tremendous, now the law was officially behind the copyright holders over the ownership of control of commercial software. Now tampering with certain software that you have bought on your own machine could be a crime. The DMCA gave a few exceptions, but they are very specific. They include some nonprofit uses, lawfully granted reverse engineering, encryption research and the protection of minors.

There is much opposition about DRM, especially in its regards to how copyright owners, now armed with DRM, can have too much effect on the ability for people to share and distribute information freely. Free software sharing and distribution are philosophies many people have on the purpose of the internet and software. For example, a famous opponent of DRM, Richard Stallman, describes a future in "The Right to Read" where the sharing of important fundamental programs, like a debugger, no longer becomes free even to students. In this future, he even describes how all software becomes so restricted by DRM and copyright holders that it becomes impossible for someone to even share their machine to someone they love. Because software will contain DRM to enforce only one user per digital copy, sharing a machine to use any of the copyrighted software would also therefore be illegal. Another proponent against DRM, John Walker, in his paper "The Digital Imprimatur" greatly opposes DRM.

John Walker describes a future with DRM that is based on "certificates". Certificates allow the government and servers to potentially track individual people, programs or organizations. John Walker goes on to say that the integration of certificates

among all programs will result in solving many "child" problems in the internet by bringing an end to anonymity. Although, solving these problems are good, they have far too potential problems. He points out that such a system has too much control over what is available on the internet and gives too many ways to hamper free speech and free information distribution. He goes on to explain how the government has regulated past broadcasting technologies, such as the television, and will continue to do so. In time, our ability to use the internet as a method to easily distribute information will become reduced, and arguments of infringement of free speech will become silenced by the copyright holders.

As of now, DRM has not yet dominated the software scene like John Walker predicted, but it is a great presence. Commercial operating systems, games, music and other consumer software often requires a serial number to become functional. Cell phones and tablets require applications to be facilitated through provided stores. Conversely, some organizations and individuals have decided to embrace the facilitated distribution that the internet has to offer to instead gain profit though gains in publicity rather than pay-per-instance business models. The independent music industry has many examples of artists using this strategy by freely giving out their music files.

It is unmistakable that file sharing and DRM software has greatly affected the nature of intellectual property. However, other factors have also played a large role in this conversation. People are not only asking "how can we protect our intellectual property?" but are also asking "what is intellectual property?". How exactly can one copyright an algorithm? Who owns a mash up song? At what level does alteration

become creation? Copyright law themselves are also a problem. Combined with the interplay of file sharing and DRM, we as a society are ultimately deciding the nature of the distribution of information in the present and in the future.

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