Student Attitudes and Behavior on File Sharing

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Media distribution is quickly changing into a digital industry. Many people choose to obtain their music online instead of purchasing it in a store. Illegal file sharing is a much faster growing issue than ever before, resulting in the breaking of many copyright laws. If it was known what made illegal file sharing so intriguing, legal downloading systems could be designed accordingly. A survey of 92 students at a medium-sized, public liberal arts university inquired into how much students are engaging in this behavior, how much they know about the surrounding laws, and why they choose to download illegally. The results showed that 83% of students download digital files and 54% share their own files. Reasons for their behavior include cost issues, laziness and convenience. A majority of students knew little about the legal issues. In general, students do not fear punishment as the copyright laws are not often enforced. Students tend to use systems that are easy to use. Legal download systems, e.g. iTunes, are more difficult to use and require users to own a credit card, which may not be possible for all college students.
Keywords: Filesharing, ethics, students

1. Introduction and Related Work

This study of music piracy issues has 3 primary goals: find out how students feel about file sharing, find out how many of them participate in it and to what extent, and find out how much students know about the legislation and court decisions that have created the regulations in the industry that exist today.

For the purposes of this survey, file sharing is defined as any activity in a peer to peer system in which files are exchanged between users, whether the participant is only downloading files, or if they are offering some of their own files for others to download (known as sharing). Often, the files that are offered in a peer to peer system(P2P) are copyrighted works, which is the issue that this study is focused on. Even though downloading can include buying songs online and putting them on your own computer legally, for this survey, downloading refers to songs that are copyrighted, but were not properly paid for. Buying songs online refers to a "pay per song method" or a "paid download" for this study.

To write this survey and research this topic, the recent literature about this topic was reviewed to find out what other researchers with similar topics found. Most of the studies were much narrower than the behaviors and attitudes of all file sharing. Some of them actually interacted with the file sharing systems or went inside to observe the traffic of users in the system. Hughes, Walkerdine, Coulson, and Gibson[9] watched traffic in Gnutella for illegal porn by intercepting searches. Their main finding was that perceived anonymity has a direct relationship with how much deviant behavior one will engage in. The authors of "Public Domain P2P File-sharing Networks Measurements and Modeling"[11] tracked 5 peer to peer systems for 3 years to see their evolution so that in the future P2P systems can be designed to better meet the needs of their users, including allowing more users to make use of the system simultaneously. Some of the features found to attract users included a modern look and feel, plenty of files available, and number of users the system can support at a given point in time.

Several empirical studies were also found to look at how their surveys were designed, and what their findings were. Amoroso and Guo[1] found that more experienced users are more likely to continue downloading in the future and that one of seven users (in their research sample) have stopped downloading due to recent legal actions. Becker and Clement[2] found that reciprocity is the main reason why users choose to share files. Fetscherin[7,8] discussed that

in Kazaa it is very likely that a user will find a high quality file of the song they are looking for relatively quickly and that "free riding is not a problem, since the number of files increases fairly proportionately with the number of users currently logged in. In his second study he found that most content providers have some form of Digital Rights Management technology and they are satisfied with what they have. Findings by other researchers include: 75% of users use a search engine and file sharing systems need to develop better tools to accommodate this[3], consumers are greatly affected by perceived prosecution risk, and social consensus, as well as band idolization[5], and focus groups may not be the best way to discuss file sharing issues as there's no anonymity[10].

The survey instrument used for this study is not directly from any one source, nor is any particular question exactly what another survey asks. However, ideas and findings helped to develop a survey that would accomplish the goals for the empirical study. This study is limited it to only music files, otherwise it encompasses too many topics and it would have to be a much longer survey to be able to conclude anything about a given topic.

2. Research Questions and Hypotheses

Some of the research questions that I had for this study were:
- What percentage of students participate in these activities?
- Do students share music?
- Are they expecting others to do the same?
- How much are they sharing?
- How much less are students spending on music with file sharing available?
- What is their reasoning for doing so vs. purchasing the CD at a store?
- How much of their personal music library is made up of illegally downloaded files?
- Does course of study affect whether or not students participate in file sharing?
- Is one gender more likely to participate in file sharing than another?
- What legislation and litigation are they aware of that govern this area?
- Do students fear being caught and the punishment they will receive?
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The hypotheses for the results of this study are:
- Those who said that they download on a regular basis don't use a pay per song method frequently.
- At least 50% of the participants agreed that they often burn CD's for friends.
- More students who said that they are technology savvy use a system that hides their identity than one that is easy to use.
- At least 75% of students who don't download don't share music.
- Limewire and Kazaa are the most used systems among participants.

3. Research Approach

A survey was chosen as the research instrument since the purpose of this research was to find out what students are doing as well as what they think of music piracy and file sharing issues. A survey was selected versus interviews or something of that nature as I wanted to keep the process quick and easy for students to complete, and wanted the research to be anonymous so that students would be more honest about what their current behaviors are. To avoid bias, a large part of the survey, all questions except the first four, and the last five, were questions in which participants are given a statement and asked to rate it based on a Likert scale.

An anonymous survey online, administered and created on WebSurveyor, was chosen as the distribution method for this study. This was chosen as WebSurveyor is a powerful surveying tool, with the ability to use conditional logic which would have been difficult to implement in a paper survey, as well as statistical analysis tools and charts for results. Given the time constraints of the semester, this was the most logical approach. The survey was marketed through email campaigns to other classes, the entire department, as well as utilizing messaging features on social networking sites.
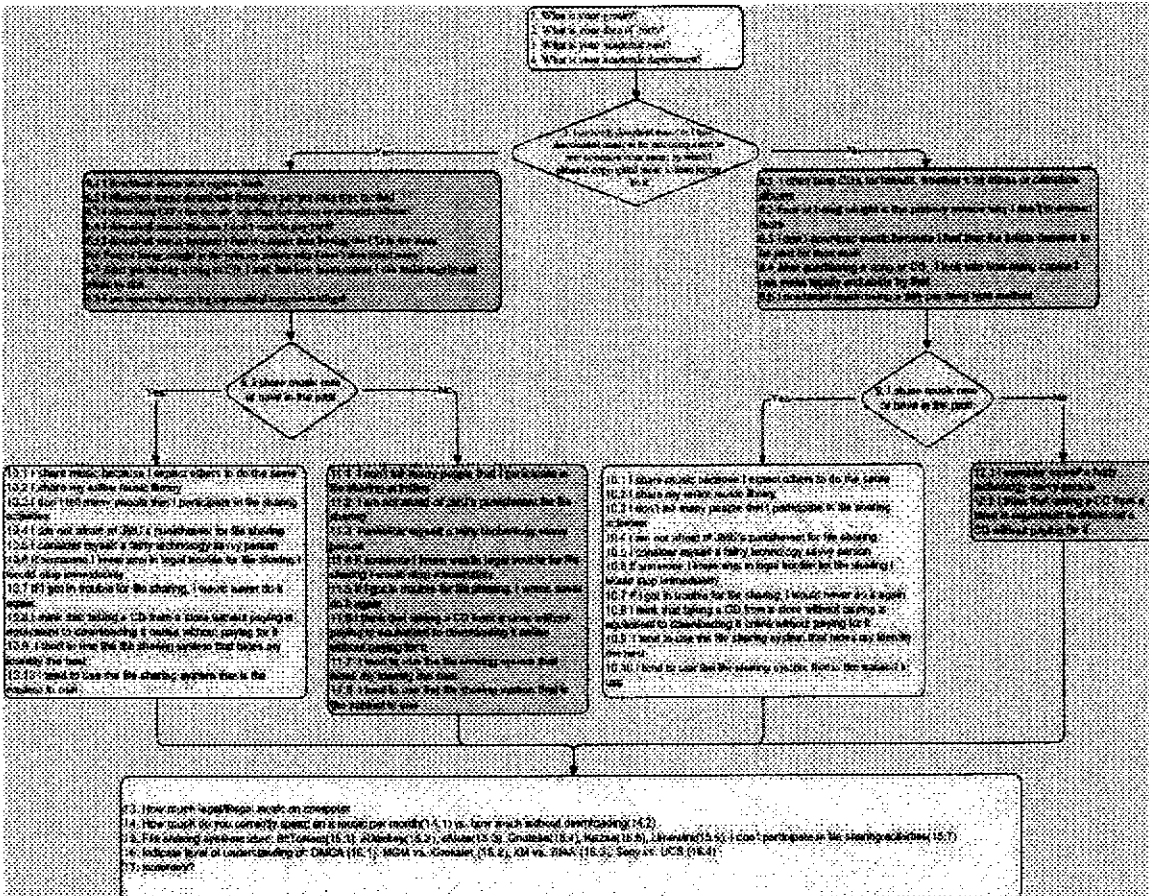
Figure 1. the survey used – please refer to this diagram to find out what a specific question asked

Results

After making the survey public for approximately 5 days, Friday, April 13, through Tuesday, April 18, 93 completed surveys were received. This is slightly fewer than hoped for, but due to time constraints, and close proximity to 100, the survey was closed. The research sample was composed of 50 males and 42 females, so very close to being completely unbiased. Out of the 93 who completed the survey, 81 were from the College of Integrated Science and Technology, College of Business, or College of Arts and Letters, descending order by number of participants. No comparisons are made based on class status as the survey was extremely biased in this area, with over 70 of the 93 participants being juniors or seniors. For data analysis, a combination of SAS software and Microsoft Excel is being used. After reviewing the results, some of the research questions have been answered, however not all of them could be conclusively answered by the data that was collected.

4.1 What percentage of students participates in these activities?

Out of the 93 students who participated in the study, 78 (83.87%) responded positively to Q3. On Q6/Q9, 54.84% responded "yes." Therefore, 86.02% of participants said that they do participate in some form of file sharing.

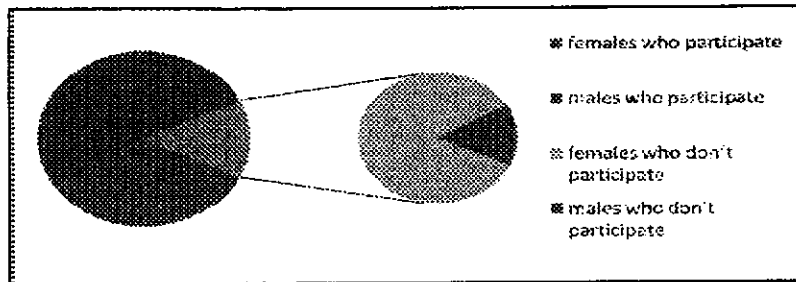## 4.2 Is one gender more likely to participate in file sharing than another?

Figure 2. gender participation in file sharing

In the sample collected, there was not a significant relationship between gender and participation in file sharing. Out of 50 males, 48 of them said that they download music and 15 share, with 96% of males participating in some form of file sharing. On the other hand, out of 42 female respondents, 29 download and 17 share, with 73.8% of all females participating in some form of file sharing, as seen in Figure 2. It appears that a male is slightly more likely to participate in file sharing than a female, but being male does not imply that he participates in file sharing, nor vice versa, based on the findings of this study. Based on calculation of the Pearson Correlation Coefficient(r) and r^2, only 10% of variance in file sharing participation is caused by gender.

4.3 Does course of study affect whether or not students participate in file sharing?
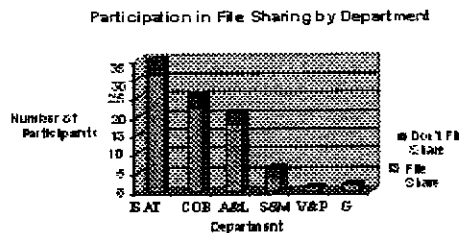

Figure 3. academic department participation in file sharing

As seen in Figure 3, there are six departments that had students respond that they participate in file sharing activities. Visual and Performing Arts and Graduate Departments had 100% participation, but there were only 1-2 students in the survey sample for each department, so that data was not considered, nor was Science and Mathematics, as it only had six students. Looking at the other three departments though, Integrated Science and Technology had 88.57% participation, College of Business had 88% participation, and College of Arts and Letters had 85.71% participation. Based on these numbers there is no correlation between field of study and file sharing behavior.

4.4 What is their reasoning for doing so vs. purchasing the CD at a store?

When asked Q 6.4, the average answer was 3.45 and a standard deviation of 1.36. Survey participants were also asked Q 6.5 on which the average response for this question was 3.99 and the standard deviation was 1.10. So students are choosing to participate in file sharing because it is easier, which could include reasons such as hard to make it to store, don't always want the whole CD, etc. Students also consider cost when deciding how to obtain their music.

4.5 How much of their music library is legal?

One of the last questions on the survey asked participants to consider their personal music library and come up with approximate percentages of legal (comprised of CD's bought, songs purchased through a pay per song venue, etc.) and illegal (burned CD's from friends, files attained through a P2P system, etc.) music. They were given a scale 1 to 10, and asked to place the marker at the number that most accurately described their music library with 1 being all legal and 10 all illegal. The results are given in Figure 4.
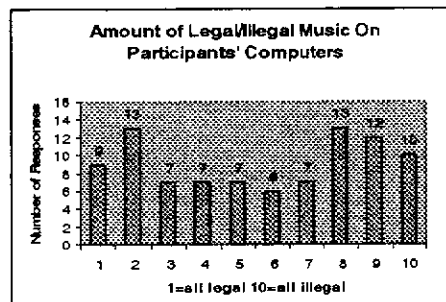
Figure 4. amount of legal vs. illegal music on computer

A total of 91 students completed this question. Over half the sample, 55 participants, answered that at least half of their music library is illegal, and one-third, 35 participants, said that at least 80% of their music library is illegal. Yet only 9 said that their entire music library is legal. The average response was 5.67 with a standard deviation of 3.05.

4.6 What legislation and litigation are they aware of that govern this area?

As expected, very few students were familiar with the legislation or litigation for electronic copyright issues. For this set of questions, participants were asked to say if they had never heard of it(1), heard of it(2), or could explain it (3). Only one student answered that they could explain all four items.

The Digital Millennium Copyright Act of 1998 defined that it is illegal to try to circumvent anti-piracy measures in software, ISP's are not liable for copyright infringement just by sending the information, etc[6]. Out of 92 people who answered this question, 21 said that they could explain it, and a mean answer of 1.75.

MGM vs. Grokster, a court case in 2005 where it was decided that Grokster did not know that the copyright infringement was happening until after the transfer had been made since they did not have a centralized server, so they could not be blamed for their software being used for copyright infringement, since it did have legitimate purposes [12]. Out of 91 students, 52 participants had never even heard of this case, with an average score of 1.54.

RIAA vs. XM is a current case in which the RIAA is suing XM for enabling consumers of some of their products to infringe copyrights by allowing them to record the radio easily and listen to the songs later[4]. Only four students out of 91 said that they could explain this case with a mean of 1.36.

In *Sony vs. Universal City Studios* (1984), decided that Sony, the maker of video recording devices was not liable for copyright infringement, by allowing users to "time shift" TV shows. This case was exactly 50/50 for students who had at least heard of it and those who had not, one of the better known among participants[13]. The average answer was 1.71.

4.7 Do students fear being caught and the punishment they will receive?

There were four different questions that had to do with this topic, As a whole, it does not appear that students fear punishment for file sharing participation. Please refer to Table 1 for a summary of questions and responses.

Table 1. summary of results on questions regarding fear of punishment for file sharing activities

Question	Mean	std. dev.
6.6- Fear of being caught is the only reason why I don't download more	2.258	1.375
10.4- I am not afraid of JMU's punishment for file sharing	2.85	1.216
10.6- If someone I knew was in legal trouble for file sharing, I would stop immediately	3.2	1.187
10.7- If I got in trouble for file sharing, I would never do it again.	3.65	1.152

The only question that showed that students do fear some punishment is Q10.4, in which the question is phrased for JMU specifically. As can be seen in Table 1, the mean of 2.85. All of the scores are around three, not decisive on the issue overall.

4.8 Do students share music?

In the research sample for this study, 54.83% of students, as shown in Figure 5a, share at least some portion of their music libraries with other users of a peer to peer system. This is higher than expected but some may be because some systems require that participants must share some music to be able to download.

4.10 Are they expecting others to do the same?

As shown in Figure 5b, the vast majority of students who share do not expect others to do the same. The average answer was 2.392, with a standard deviation of 1.30. Only thirteen answered that they agreed with the question, where as over half the sample, 26 participants, answered that they disagree.

4.11 How much are they sharing?

The average answer when asked if they share their entire music library was 2.52, showing that the vast majority do not share their entire library, as seen in Figure 5c. This may be caused by the fact that the primary people who get sued for file sharing are those that make large quantities of music available on a peer to peer system.
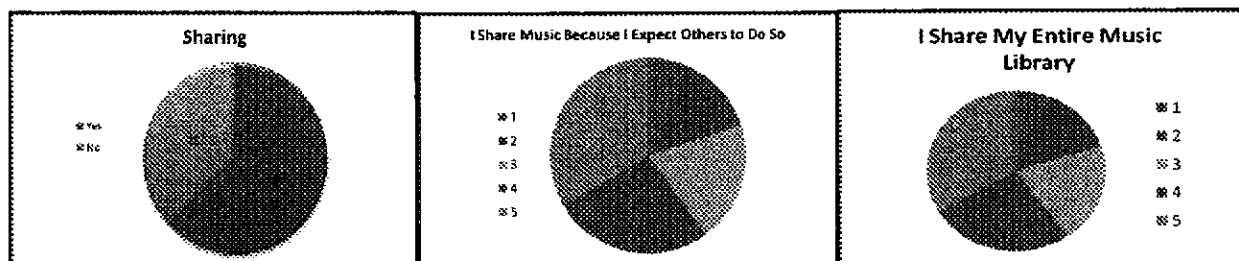

Figure 5a, b, c. summary of data involving sharing of music

4.12 How much less are participants spending on music with file sharing available?

Participants were asked how much they currently spend per month, then how much they would be spending without file sharing available. There were several students who declined to participate or put zeros in for both values. In both situations, the data was eliminated, therefore, for this question, the number of valid responses was 65.

The average amount spent with file sharing was $11.17, where as the average for without file sharing was $21.03, an average difference of $12.66. Considering that this was on a per month basis, over $12 is a significant difference.

4.13 hypothesis 1: those who said that they download on a regular basis don't use a pay per song method frequently.

After performing a T-Test on the data for Q6.1 and Q6.2, it was found that people who said that they download on a regular basis are less likely to use pay per song method to purchase music. The population size, n, was equal to 93 for this question. Those who answered at least neutrally to Q6.1 are considered regular downloaders, and those who answered that they disagree with the statement were considered non-regular downloaders. The mean for the regular downloaders is equal to 2.0, and the mean for non-regular downloaders was 2.7. A significance level, p-value, was found for this sample to be equal to .0311 and the test for equality of variance was met. This test proved that there was some correlation, but not as strictly as hypothesized.

4.14 hypothesis 2: at least 50% of participants answered at least neutrally that they often burn CD's for friends

This hypothesis was not true. Out of 93 participants, 45 answered at least neutrally for Q6.3 and 48 answered negatively. The mean answer was 2.64, with a standard deviation of 1.31. This result was surprising as the majority of people are willing to burn a CD for someone even if they will not participate in file sharing.
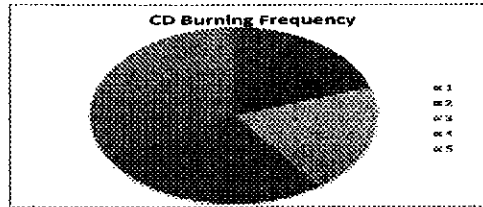
Figure 6. responses for frequency for CD burning

4.15 hypothesis 3: more students who said that they are technology savvy use a system that hides their identity than one that is easy to use.

Relevant questions for this hypothesis include: Q10.5, Q10.9, and Q10.10. The Pearson Correlation Test was performed on the data for these 3 questions. For this question, the population size, n, was equal to 80 and the p value was .0320. The correlation coefficient was found to be equal to .23996 and $r^2 = .05758$. So, being technology savvy and choosing a system that hides one's identity are significantly correlated, but only 5% of the variance can be explained by this relationship. However, being technology savvy is not significantly correlated to choosing a system that is easy to use.

The actual hypothesis is true though. After doing a simple logic test to pull out all participants who answered all three questions and answered that they at least agree (answered 4+) that they are technology savvy, it was found that out of a pool of 49 qualifying participants, 27 responded with a higher rating on Q10.10 vs. Q10.9 to which 12 people ranked higher. The other 10 participants ranked each statement equally.

4.16 hypothesis 4: at least 75% of students who don't download music illegally don't share music with others on a peer to peer system.

Out of 15 students who answered negatively to Q5, only 2 responded positively to Q9, equaling out to 13.33% of student who share but not do not download. This is logical as most people are looking to get some benefit out of file sharing and if not downloading, there's not many benefits to sharing.

4.17 hypothesis 5: Limewire and Kazaa are the most used systems among participants.

When compiling the survey for this project, some simple research was done to see what the most popular systems were, by doing a search on Google for "file sharing system" and seeing what the first results were, or asking friends what systems they use. A list of six different systems that were listed on the survey, which can be seen in Figure 7. The most used systems by far among participants were, Limewire and Kazaa, with 56 and 37 students marking them, respectively. This was not surprising as they are two of the most publicized and well known systems. Several students did list other systems; among the ones listed by multiple students are: MyTunesRedux, which is a program that allows you to download other users' shared libraries on the same network on Itunes, Napster, IRC's and news groups, which are forum like settings in which users can exchange files, but they were not created for file sharing purposes. Students use a wide variety of programs and venues to download and share music.
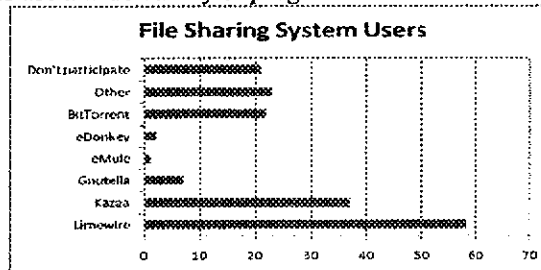

Figure 7. summary of answers received regarding what systems are used

5. Discussion and Conclusion

As mentioned in the beginning, this research had three primary goals. 1) Find out why students participate in file sharing, 2)Find out how many of them do or do not participate in it and to what extent, and 3) Find out how much students know about the legislation and court decisions that have created the regulations in the industry that exist today.

Many college students choose to participate in file sharing for various reasons. Some of these include the fact that it's free and it's fairly easy to do. The vast majority of students responded that they agree that download music because it's easier than buying a CD. File sharing is technically even easier to do than doing paid music downloads. Not everyone has a credit card they can use, eliminating all paid music downloads.

According to the data collected in this survey, approximately 83% of students download music and 54% choose to share music. Those who don't download music answered Q8.2 and Q8.3, both with a mean answer over three, averages were 3.3 and 3.8 respectively. The average score for using a pay per song method was slightly higher for those who don't download illegally vs. those who do, but not significantly so. Some of them may just be against the conversion of music to a completely digital industry. Most participants who do download are not ashamed of their file sharing behaviors, partly because it has become acceptable in today's society.

While there are consequences in place, and students are aware that people are getting sued for file sharing, there have been very few cases that have been publicized. Students do fear punishment to a certain extent, but since it isn't happening around them, they aren't that concerned about it. Overall, students are not aware of the legislation or the litigation in recent years, partly because the regulations that exist are not very well enforced. Students also have a tendency to believe that "it won't happen to them" so they are going to continue doing it.

Bibliography

1. Amoroso, Donald, and Guo Maggie. "An Analysis of the Acceptance of File Sharing Technologies by Music Consumers." IEEE (2006): 1-10. IEE Computing Society Digital Library. JMU Carrier Library, Harrisonburg, VA. 28 Feb. 2007.
2. Becker, Jan, and Michel Clement. "Dynamics of Illegal Participation in Peer to Peer Networks- Why Do People Illegally Share Media Files?" Journal of Media Economics 1.19 (2006): 7-32. Google Scholar. JMU Carrier Library, Harrisonburg, VA. 27 Feb. 2007.
3. Benlian, Alexander, Benedikt Von Walter, and Thomas Hess. "Semantically Enriched Information Seeking in Peer to Peer File Sharing Systems- Empirical Evidence From the User Perspective." IEEE (2005): 1-10. IEEE Computing Society Digital Library. JMU Carrier Library, Harrisonburg, VA. 26 Feb. 2007.
4. Berger, Adam. "Details on the RIAA Vs. XM Lawsuit." Gadgetell. 19 May 2006. 18 Apr. 2007 <http://www.gadgetell.com/2006/05/details-on-the-riaa-vs-xm-lawsuit/>.
5. Chiou, Jyh-Shen, Chien-Yi Huang, and Hsin-Hui Lee. "The Antecedents of Music Piracy Attitudes and Intentions." Journal of Business Ethics 10.57 (2005): 161-174. Google Scholar. JMU Carrier Library, Harrisonburg, VA. 26 Feb. 2007.
6. "Digital Millenium Copyright Act." The UCLA Online Institute for Cyberspace Law and Policy. 8 Feb. 2001. UCLA Online Institute. 18 Apr. 2007 <http://www.gseis.ucla.edu/iclp/dmca1.htm>.
7. Fetscherin, Marc, and Matthias Schmid. "The Application of Digital Rights Management Systems in the Music Industry- an Empirical Investigation." IEEE (2003): 1-8. IEEE Computing Society Digital Library. JMU Carrier Library, Harrisonburg, VA. 28 Feb. 2007.
8. Fetscherin, Marc. "Music Piracy on Peer to Peer Networks." IEEE (2004): 1-10. IEEE Computing Society Digital Library. JMU Carrier Library, Harrisonburg, VA. 27 Feb. 2007.
9. Hughes, Daniel, James Walkerdine, Geoff Coulson, and Stephen Gibson. "Peer to Peer: is Deviant Behavior the Norm on P2P File-Sharing Networks?" IEEE Distributed Systems Online 7.2 (2006): 1-10. IEEE Computer Society Digital Library. JMU Carrier Library, Harrisonburg, VA. 28 Feb. 2007.
10. Hughes, Jerald, and Karl Lang. "Issues in Online Focus Groups: Lessons Learned From an Empirical Study of Peer-to-Peer Filesharing System Users." Electronic Journal of Business Resarch Methods 2.2 (2004): 95-110. Google Scholar. JMU Carrier Library, Harrisonburg, VA. 27 Feb. 2007.
11. Lloret, Jaime, Juan Diaz, Jose Jimenez, and Fernando Boronat. "Public Domain P2P File-Sharing Networks Measurement and Modeling." IEEE 6.7 (2004): 1-7. IEEE Computing Society Digital Library. JMU Carrier Library, Harrisonburg, VA. 27 Feb. 2007.
12. "MGM Vs. Grokster." Duke Law. 2006. Duke University. 18 Apr. 2007 <http://www.law.duke.edu/publiclaw/supremecourtonline/certgrants/2004/mgmvgro.html>
13. Walton, Taylor. "Goden Age of Free Music Vs. Copying is Stealing." The Register. 6 Aug. 2003. 18 Apr. 2007 <http://www.theregister.co.uk/2003/08/06/golden_age_of_free_music/>.