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Abstract:

In a 1996-7 survey of students at three public universities and one private liberal arts college, Chiang and Assane (2002) found that 53 per cent of the sample admitted to software piracy. Though this is a staggering percentage, over the past five years the public focus on copyright piracy among young technology savvy users, particularly university students, has shifted from software to music piracy via file sharing and CD reproduction. This paper studies the characteristics of these industries along with recent technological advances affecting them. We analyze how economic incentives to reduce piracy on the university campus have been successful for the software industry, and how the lack of such incentives in the music industry has caused a larger piracy issue today. Based on these findings, we discuss possible solutions to reducing music piracy on the university campus.

Copyright Piracy on the University Campus: Trends and Lessons from the Software and Music Industries

Introduction

Copyright piracy has been a persisting problem since the dawn of the information age. The technology to reproduce information-goods, goods where the majority of the value derives from the inherent creative content rather than their physical form, has become increasingly efficient and less costly. As a result, the ability to obtain near exact reproductions of software, CDs, DVDs, and to a lesser extent books and manuscripts, offers consumers an opportunity to capture more consumer surplus at the expense of the copyright holder. There are drawbacks, however; for example, illegally reproduced versions of software often lack user manuals and consumer technical support. In addition, increased piracy results in higher prices to those who purchase goods through legal channels. Thus, unless one acquires *all* copyrighted goods through illegal channels, the costs of piracy are shared by all consumers. In a similar sense, as piracy reduces overall profit, producers also suffer costs.

The precise definition of *piracy* is ambiguous. On the supplier side (i.e. software and music firms), piracy is generally defined as the duplication and/or distribution of a copyrighted good without license. However, on the demand side, many argue this definition ignores the existence of ‘network externalities’, an idea that the more users of a product (licensed or not), the greater its value (Shy 1999). In essence, many unlicensed users who find a product satisfactory eventually become licensed users. Although both sides have valid arguments, the difficulty lies in the fact that deferred economic gains to copyright holders are difficult to measure, while current losses are not. In an independent study on estimated annual losses due to software piracy, the International Planning and Research

Corporation (1999) estimated the worldwide revenue loss due to software piracy in 1998 as approximately US\$11 billion. This figure was calculated based on the difference between estimated demand for software worldwide and actual shipments by software firms. Again, this estimate ignores any potential deferred gains.

This paper analyzes copyright piracy by university students. A recent study by Chiang and Assane (2002) found that 53 per cent of sampled students admitted to owning unlicensed software. In the same vein, universities face growing concern over additional types of media piracy on campus, particularly music piracy, which has gained abundant attention due to recent high profile lawsuits against developers of file-sharing software that allows copyrighted music to be acquired at negligible cost. In this paper, piracy is defined as the *act* of acquiring copyrighted products without license. Simply stated, in the context of a university, when a copyright law is broken, universities become concerned as they can face negative publicity along with the risk of large fines. Efforts to reduce copyright piracy in universities as well as in a general setting have met significant difficulties. One concern is that enforcement is arbitrary (see Klein et al. 2002 and Romer 2002 for a recent discussion). Another point of view says copyright enforcement is not economically efficient if potential deferred gains resulting from piracy exist (see Watt 2000 and Boldrin et al. 2002). Comparing the software industry with the music industry, we argue in this paper that economic incentives play an important role in the success of copyright protection, and that students are no exception—they respond positively to incentives, which in turn may lead to less piracy. The remainder of the paper is organized as follows. First, the motivation behind copyright violations is discussed. Then, an analysis of the software and music industries illustrates and compares key problems and possible solutions. A final section concludes.

The Art of Sharing Re-Visited

Individuals gain from ‘sharing’. Sharing goods can increase consumer satisfaction by diversifying the bundle of goods that one consumes. This holds true whether a good is characterized as single-use (sharing foods in a pot-luck setting) or multi-use (sharing a book). In order to understand how individuals benefit from sharing, our analysis begins with a simple example of comic book trading among youths. We then examine the more complex scheme regarding software and music products.

First, consider the case of comic book sharing among youths. Assume each child owns a collection of comic books that he or she acquired through purchase or as a gift. Assuming after each book is read, value remains in the book if additional children read the same book, then the Pareto-improving action is to trade comic books after one reads their own. This form of sharing is a type of localized information dissemination that is legal under most copyright law (i.e. Title 17 U.S. Code) because there exists only one authorized user at a time; in essence, the original comic book is shared in the same fashion as a library book.

Now consider the parallel with software and music products. The notion of sharing software programs has existed since the introduction of personal computers. One user would purchase or acquire software, then share their collection with another much like the sharing of comic books. However, a key difference arises: instead of relinquishing the software (as with the comic book), the owner makes a copy of the software and trades reproductions of the software with others. This form of sharing is illegal under copyright laws of most nations. Moving forward into the digital music era and the dawn of the Internet and ‘file-sharing’, technological advances have allowed the art of sharing to evolve from localized to global exchanges. One can now ‘share’ software and music products with others around the world, without even knowing with whom one is sharing.

Furthermore, one can share exponentially— a single original good generating thousands or millions of reproductions. The global expansion of illegal sharing, common among software and music products, has become a critical problem threatening the value of intellectual property.

Software Piracy on the University Campus

Software copyright piracy is a major problem facing universities. Chiang and Assane (2002) used a sample survey of students from four U.S. universities to estimate the likelihood of software piracy based on student characteristics. For example, a student's major, class standing, and personal risk perceptions each influence the propensity of software piracy. Based on this work, the leading causes of software piracy among university students can be reconciled.

First, many university classes require students to obtain and use computer software. In addition, students also use such software for personal activities. Second, students have above average technical skills compared with the general population, facilitating reproduction methods. Third, students have low levels of disposable income relative to the general adult population because many do not work or only work part-time. Furthermore, the high cost of a university education itself drains the budgets of many self-financing students leading them to look for less expensive means of obtaining software. Finally, the university atmosphere provides access to peers with similar attitudes that may perhaps be more risk-preferring than average.

Universities are concerned with the level of software piracy. It bestows a dishonorable label upon the institution, although for some students, software hackers are admired for their acute intellect. In terms of resources, the exchange of software or music via the Internet exhausts the server capacities at many universities (Anderson 2000), leading to greater expenditures and the need to expand server capacity. Above all, universities face the risk of hefty fines and

reprimands as software firms pursue and prosecute alleged copyright infringements on campus. But instead of relying on universities to reduce copyright violations, the software industry itself has sprung into action.

In the latter part of the 1990s, the software industry took substantial steps to increase the incentive for university students to acquire software goods legally. For example, software firms entered into extensive agreements with computer makers to offer software bundles that are pre-installed when the computer is purchased. Thus, the cost of the software is embedded in the price of the computer at a substantial reduction in price compared with the price when sold individually. This is successful because of the nature of bundling—consumers obtain some software that is valuable to them and some that is not. By charging a single price for the bundle, the software firm increases revenues by selling software to both consumers interested in the software as well as those who are not. Even at a reduced price, software makers often increase revenues using this approach.

According to Chiang and Assane (2002), price is the most important reason for software piracy. Of those students admitting to owning unlicensed software, 7 of 10 say their decisions were primarily influenced by money, while far fewer were influenced by software availability or convenience. Some software makers have responded by providing software free on the Internet and relying on alternative forms of revenue, such as Internet advertising and premium services.

Another common technique used by software firms is offering student discounts or student versions of software, allowing students to purchase goods at lower prices. This is an example of second and third degree price discrimination that increases revenues to software firms. Some students who would have pirated software are now purchasing licensed copies at reduced prices; benefits include access to technical support services, software upgrades and patches, along with user manuals.

Finally, the software industry has taken advantage of the benefits of licensing software. For example, a software firm charges a fixed fee to a university allowing up to 1000 computers on campus access to the software and 200 at-large transferable licenses (i.e. copies that faculty or students can use temporarily on their personal computers). The benefits are two-fold: universities can equip offices and student labs with the latest software at reduced group prices, and they can offer secondary licenses to students and faculty to use the software at home (usually with a built-in timer to allow for temporary access). Both results allow greater access of software to students, reducing the desire to obtain software illegally.

The efforts of the software industry have generated some success. Although the average usage of software continues to rise among university students, evidence shows that software piracy has not risen, and may have even slightly dropped (Hoover 2002). But despite these encouraging findings, software violations by university students are still far from over (Carnevale 2002). Yet, in recent years, greater public attention has shifted to music copyright violations, a shift that is likely due to their overwhelming increase in the past few years.

The Music Industry and the University Campus

The idea of storing music on a personal computer is not a new phenomenon. Music files have long been available. However, the process of acquiring music files has changed in recent years with the introduction of high-speed Internet access and CD read-and-write drives. Now, music lovers can download music from various Internet sites and from other individuals using file-sharing software, or they can duplicate existing compact discs. This section focuses on the use of Internet file-sharing software.

File-sharing software gained worldwide attention when Shawn Fanning introduced Napster in 1999. By Autumn 2000, there were an estimated 70 million

users exchanging billions of music files across the Internet (Liebowitz 2002).

File-sharing software such as Napster is unique in the sense that individuals have access to a virtual database of music files *without* the existence of a centralized database. The software works as follows: when an individual installs the software and is online, any music file stored in the Napster folder becomes available for any other user to identify and download. The software facilitates the process by providing a search engine that allows one to search the music collection of every connected user in the world. The end result is the vast transfer of music files worldwide.

A number of critical issues arise from file-sharing software. First, from a legal standpoint, it is unclear whether the service or its users violate copyright law because such technology is not explicitly described in existing laws. Nonetheless, most courts have interpreted the actions of file-sharing software users as copyright piracy because a copyrighted good has been attained without compensation to the copyright owner. Users of file-sharing software have largely balked at attempts by the music industry to stop file-sharing, particularly those that are offered free. Another concern is that many users are in countries without effective copyright laws. But focusing on universities, the ubiquitous presence of music-reproduction via file-sharing is a clear concern to the music industry as well as to universities themselves.

Many universities have taken steps to limit or ban file-sharing, particularly music-sharing software. Unlike most software, the vast majority of music-sharing performed using university servers is for non-academic purposes. In addition, music-sharing consumes a high level of Internet bandwidth. It has been estimated that during the height of the problem, nearly half of university server capacities were used for music downloads, reducing the efficiency of Internet servers campus-wide (ResNet 2000). The concern here is that universities purchase server

capacity to facilitate academic purposes. Music downloads, with no academic value, result in additional costs.

Solutions to Music Piracy on the University Campus

The solution to music piracy is not one that can be imposed overnight using draconian enforcement methods. Recent attempts to do so by way of court litigation yielded few results and increased the rift between producers and consumers. An alternative approach taken by many European nations is the introduction of levies on various types of recording media, which theoretically are distributed to copyright holders. This approach is based on the theory of appropriation, where a copyright holder acknowledges the existence of reproduction but charges higher prices to those more likely to do so (Liebowitz 1985). However, due to their discriminatory and arbitrary nature, the success of levies has been small compared to their opposition.

As the experience of the software industry suggests, a significant reduction in music piracy will occur only when the incentive not to engage in such activities is sufficient. And though the threat of punishment is indeed one such incentive, it needs to be complemented by other economic incentives attractive to music-sharing proponents such as university students.

The most common suggestion to reduce music piracy is to simply reduce prices or offer student discounts similar to the software industry. However, key differences arise. First, student versions of music CDs are impractical. Second, while the software industry derives a majority of its revenues from corporations, universities, institutions, and government, the music industry derives most of its sales from the very target of the music piracy problem: young individuals. Therefore, while reducing prices for young consumers may help deter piracy, it is not likely to increase revenues in the music industry. Various alternative ideas

based on economic reasoning and lessons from the software industry are discussed below.

First, there is the possibility of licensing music; the equivalent of a fee-based music-sharing agreement. Using this method, users pay a monthly fee to access a database of old and new music produced by music distributors. Several large music distribution companies have recently attempted, though largely unsuccessfully, to introduce these services (Mathews et al. 2002). Complaints among subscribers include the limited music selection compared to free music-sharing sites and the inability to transfer downloaded music to portable CDs.

Another approach to promote the use of licensing is to bundle licenses with the purchase of a computer, thereby embedding the cost of licenses into the computer. A comparable approach is the current practice of bundling Internet access with computer purchases. Using this method, purchasing a computer would include, for example, access to a selection (based on music tastes) of both classic and current music for a limited period of time.

Aside from lessons of the software industry, a key concern among users of music-sharing software is that they desire only selected titles by an artist, not the entire album. In the past decade, the production of music singles, particularly in the U.S., has nearly ceased. Consumers argue that the 'greed' of music distributors selling full albums exclusively has spurred greater music-sharing. In contrast, distributors claim that music-sharing software has evaporated the demand for singles because many consumers simply download them. A consistent implication from this is that increasing the availability of singles will reduce piracy, but will have an uncertain affect on overall profits. The question remains whether the re-introduction of music singles would generate profit despite the existence of file-sharing, or become another large financial loss to distributors.

Finally, and perhaps the most promising idea to reduce music piracy by students is to increase the linkages between music distributors and universities themselves. Although universities do not have a large stake in music products compared to software products, there are incentives for cooperation on both sides. Many universities have already taken action by introducing awareness campaigns and heightening the use of anti-piracy devices on university networks (Kearney 2000).

Conclusion

Copyright piracy can be argued as a consequence of technological innovation (Silva & Ramello 2000). As file-reproducing technologies continue to enhance the information era, the need to protect information goods from their unauthorized reproduction remains an important objective for copyright owners. This paper has analyzed the incidence of copyright piracy on the university campus, specifically in the form of software and music piracy. These goods are highly prone to unauthorized reproduction due to their useful and popular nature, along with the abilities of students to produce near-perfect copies at minimal costs. To combat this problem, the software industry has taken steps over the past five years to decrease the incidence of software piracy. Based on survey findings of university students between 1996 and 2000, these efforts are at least stemming the tide if not decreasing the rate of software piracy.

More recently, the music industry has taken center stage as a result of a surge in piracy, largely attributed due to the invention of 'file-sharing' software allowing users to easily exchange music files (and software programs) over the Internet. Because of the rapid growth in piracy, the music industry faces a critical dilemma- it needs a short-run solution before it can engage in a long-run solution. Its short-run solution was to confront the use of file-sharing software via lawsuits and enforcement threats. The optimal long-run solution is likely to parallel the

solutions used by the software industry: to decrease incentives by consumers to pirate music while increasing incentives to acquire music and other information goods through legal channels.

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