The IP War – Apocalypse or Revolution?

Tsvi Gal
Chief Information Officer
AOL Time Warner Music Group
75 Rockefeller Plaza
New York, NY 10019
1-212-275-2222
tsvi.gal@wmg.com

Howard M. Singer
VP Technology
AOL Time Warner Music Group
75 Rockefeller Plaza
New York, NY 10019
1-212-275-1476
howie.singer@wmg.com

Laird Popkin
Chief Technology Officer
TIG Ventures Group
1 Rockefeller Plaza
New York, NY 10019
1-212-275-4016
laird.popkin@wmg.com

ABSTRACT

In the Foundation series, Asimov predicted a 1,000 years of darkness following the fall of the galactic empire. In the book Noir, K.W Jeter describes a world where IP is the ultimate war. Combine them together and you have likely scenario No. 1…

The Internet era enabled communication and information exchange on a global scale. But it also opened the door to copyright infringement on a global scale. Music, books, movies, software, games, speeches, research papers – everything is now fair game. The only protection the movie studios ever had was bandwidth – and it is quickly evaporating due to faster network connectivity via broadband and smarter downloading technologies such as BitTorrent.

Intellectual property, copyrights and the like are the key to a democratic, free-market civilization and greed is a prime mover – so if all is 'free' and we have a 'constitutional right' to 'share' – where is the future of innovation and creativity?

This paper will describe the current state of the great IP war (early stages of border unrest and some commando activity), outline potential futures, and make some suggestions as to how to help direct the world toward a reasonable future.

In each case, we will cover the business, legal, and social implications of the scenario and we will discuss the various ways the computing industry can help to influence the future outcome

Categories and Subject Descriptors

K.4.1. [**Computers and Society**]: Public Policy Issues – *intellectual property rights*

General Terms

Management, Economics, Security, Legal Aspects.

Keywords: Intellectual Property, Digital Rights Management, Digital Distribution, On-Line Music

1. INTRODUCTION

The music industry has faced an unprecedented amount of piracy over the past few years and the other IP industries including TV, movies and books are starting to deal with the same issues. The 'factory' for making illegal copies has moved from the back alleys into millions of homes and dormitory rooms across the country and around the world. The fraternity of those who enable the wholesale copying of copyrighted material has grown from a small group of criminals to the average teenager or grandmother next door.

We will examine the phenomenon of file sharing and hypothesize some possible scenarios for the future.

2. PIRACY IS THE SECOND OLDEST SIN

IP Piracy is an ancient phenomenon. Starting from illegal physical copying of books in the medieval times, continuing through the software piracy of the mid 1980's all the way to today's digital piracy.

In the 1980's, the Software Publishers' Association started to raid businesses in search for illegal or unlicensed copies of software being used in corporations. They found everything from illegal copies of Lotus 1-2-3 (do you still remember 1-2-3?) to overuse of Oracle licenses (Companies bought 20 licenses, but then the software was used by 17,500 people). The Far East became notorious for software piracy and, in 1996, the day Office 95 was announced (well, you know Microsoft, so what if it was 1996 for software named after 1995?), you could have gotten a copy in Hong Kong's Kowloon market for $5 – with apologies that it was so expensive because it was new.

CD's and DVD's have been pirated for many years. From time to time, the Chinese government ran a very well documented and visible raid on an illegal CD/DVD factory and executed some farmers that worked there in boxing and shipping.

According to the IFPI, global sales of pirate CD's have more than doubled in the last three years and now exceed 1 billion units each year – meaning that one in three of all CD's sold worldwide is a fake. The global pirate music market, at $4.6 billion, is larger than the legitimate music market in every country of the world except the USA and Japan. In Taiwan, the estimated manufacturing capacity for all optical disc formats is 7.6 billion units, but the total legitimate demand is only 230 million units – a recipe for increasing pirate sales. The IFPI also named its top 10 problem countries where local piracy laws remain weak and piracy rates high — China, Brazil, Mexico, Paraguay, Poland, Russia, Spain, Taiwan, Thailand and Ukraine. In China more than 90 percent of all music sales are in the form of unauthorized bootlegs, worth more than $530 million, the group said. In Asia, domestic piracy levels in 2002 exceeded 50% (i.e. the majority of CD's sold were bootlegs) in China, Indonesia, Malaysia and Pakistan. In some territories in Eastern Europe the major music companies have ceased all marketing activities as they only serve to drive up the demand for illicit CD's. [1]

A recent NY Times article demonstrates the extent of traditional (physical) piracy in China: 'A pirate DVD store above a restaurant in downtown Guangzhou makes the extent of such activity abundantly clear. The store, which can be entered only after a telephone call to the proprietor, is two air-conditioned rooms with stacks of thousands of pirated movies. Besides recent Hollywood blockbusters like 'The Matrix Reloaded' and the latest installment of 'Harry Potter,' there are 1960's French new wave classics, Japanese and Korean romances and gangster films. The discs sell for $1 to $3 each, depending on the quality of the copying technology used.' [2]

So, if this has been the case for so long, what changed? Is there a fundamental change or is the entertainment industry crying 'wolf' again like it did when cassette players were introduced or when VHS was supposed to lead to the closing down of all movie theaters?

2.1 Stealing is now personal

Commercial IP Piracy used to be institutional. In other words, to manufacture CD's and DVD's, organizations had to create factories that were physically large and capital intensive, enabling some level enforcement. But now, virtually every new PC that is purchased includes a CD burner. With a fast connection to the Internet (e.g. a home broadband connection or a campus LAN), that PC can become a source of new songs injected into p2p networks and a source of CD copies for all your friends in the neighborhood or the dorm. And while any standard PC is a perfect music factory, most feature rich PCs already come equipped with DVD burners, so movies will be following quickly behind.

3. EARLY INROADS IN DIGITAL PIRACY

Over the past several years, music industry revenues have declined 8-10% per year. For example, world sales of recorded music (audio and video) for the year 2002 fell by 7% in value and by 8% in units compared with 2001 [1]. For 2003, industry sales of CD's are down yet again in the U.S.: almost 6.9% from 2002. [3] These declines have resulted in the loss of thousands of industry jobs and cuts in the artist rosters at every major record company (for example, Sony laid off 1,000 people in March of 2003).

Over these same years, more than a quarter of a billion copies of KaZaA, the most popular file-sharing program, have been downloaded from CNET's Download.com site alone [4]. According to Business Week On-line in June of this year, 'each day more than 4 million computer users trade more than 866 million digital files on KaZaA, the world's most popular file-sharing network.' [5]

Although KaZaA is far and away the most popular file-sharing network, other programs also 'boast' of hundreds of thousands if not millions of users. [6]

Millions of people sharing files with KaZaA do it from home, but file sharing is also widespread in universities and offices where broadband connectivity is much more prevalent.

In a study spanning 560 companies, ranging from 10 to 45,000 employees, Canadian company AssetMetrix found peer-to-peer software such as KaZaA and Morpheus installed at least once in 77 percent of companies. The survey found that every company in its sample with more than 500 employees had at least one installation of file-swapping software. On average, over 9% of the over 175,000 PCs examined contained at least one file-sharing program. [7]

There are many factors that could have contributed to these enormous sales declines including the poor state of the economy, high CD prices, competition for the entertainment dollars of consumers including DVD's and videogames, and the lack of a new, popular music genre. Many 'experts' have asserted that the widespread use of file-sharing programs have actually helped the

Music industry as millions of people use these programs to discover new artists and to sample the new music from artists they know as a way to 'try before they buy.' Certainly, many people use file-sharing in just this way and their purchases of music continue. But millions of others have decreased their music purchases significantly, and they use file sharing as a way to download hundreds, if not thousands, of songs that they often burn to CD's. Data gathered from the Pew Internet and American Life project surveys fielded during March through May 2003 show that a striking 67% of Internet users who download music say they do not care whether the music they have downloaded is copyrighted. [8]

3.1 Understanding P2P Users

Forrester recently completed a survey of almost 1200 twelve to 22 year olds about downloading and CD burning. Given that people younger than 20 purchase over one fifth of all music CDs and this age group has, in some sense, grown up with file-sharing, it is particularly important to understand their behaviors in this area. Of kids 12 and 13 years old who are on-line, almost 40% downloaded a song in the previous month. In fact, this group averaged 14 song downloads per person per month. Among 18 and 19 year olds, over 60% download with an average of 23 songs downloaded per month per person. [9]

3.1.1 Music Buyers Buy Less Music

The fact that so much downloading is going on might not be a bad thing if people were using these services to find new music and then buying it. Unfortunately, that is not the case. In May of 2003, Edison Media Research asked over 1,000 record buyers a series of questions related to the purchase of music. They found that although the number of music consumers has declined by only 2 percent between 2002 and 2003, many music consumers report purchasing fewer CD's in the last 12 months than in the previous 12 months. For example, among 12-17 year olds, 35% say that they bought more music while 44% report that they bought less. For 18-24 year olds, only 26% report that they bought more while 43% report that they bought less. When asked why they were purchasing less, the top unaided response was 'Downloading/burning instead.' [10]

In a soon to be released study by Peter D. Hart Research Associates conducted for the RIAA, among people who download more from file-sharing services now than they did six months ago, 41 percent purchased less music in the past six months and only 19 percent purchased more music in the past six months. By more than two to one, those who say they are downloading more say they are purchasing less, the RIAA asserts. [11]

Although we tend to focus on music, the movie industry, unfortunately, is right behind us. 20 percent of 18 and 19 year olds have downloaded a movie in the past month according to Forrester Research. [10]

3.2 Why is this time different?

There seems to be little question that file sharing is an extraordinarily widespread phenomenon. Even with the statistics cited above, some question the entertainment industry's complaints as simply more of the same 'fear, uncertainty, and doubt ' that has greeted other new technologies in this space. The Motion Picture Association did not exactly welcome the VCR and its copying capabilities with open arms, yet the new revenues created by pre-recorded tapes (and now DVD's) have been a major source of industry growth. Home taping of cassettes was cited by the music industry as a major threat to its revenues, but it did little to hold back the enormous up tick in sales in the 80s and early 90's. Not to mention that even ten years ago, you could go on any street corner in NYC and find counterfeit CD's for sale, and that didn't hurt the market back then. Why, some say, all this moaning and thrashing about piracy and unauthorized distribution; if the industry would just climb aboard, the new technology will turn out to be a formidable engine for revenue growth.

The fact that some other technologies have ultimately resulted in larger revenues does not mean that file sharing will turn out the same way. In fact, there are three critical differences that are already evident in terms of the technology and consumer behavior that suggest the opposite:

1. The use of easily distributed software on the general purpose PC as the platform for file-sharing

2. The ability to make copies of copyrighted material available to millions across the Internet

3. The perceived 'right to share files'

3.2.1 Software moves faster than hardware

First, the digital music phenomenon and file sharing has been built by distributing software on the personal computer as a platform rather than through adoption of a new single purpose consumer electronics device. Even the DVD player, which has the fastest adoption rate of any consumer electronics platform in history, measures its progress in years. In the digital music space, the court ruling against Napster leading to its eventual shutdown occurred in July 2000.One year later, although Napster was still the most visited music site on the Internet, Wired magazine was writing about the significant upswings in traffic for KaZaA, BearShare, Audiogalaxy and iMesh. Just a few months ago, dozens of newspaper articles lauded the success of the Apple iTunes Music Store. One of the less highlighted elements of this success was the ability to deploy a new digital rights management and shopping experience by downloading new software to millions in days.

There is no doubt that hardware improvements have played an important role in this phenomenon as well. Faster processors have enabled higher quality compression algorithms and the ability for any user to 'rip' a CD with ease. The decreasing costs of ever-larger hard drives have enabled the storage of thousands of songs in a jukebox application. And as CD burners have become ubiquitous, the ability to turn those downloaded digital files back into CD's that can be taken away from the PC has maintained 'portability' for the average user. In each case, however, these hardware improvements have built upon the open PC platform rather than requiring the purchase of an entirely new device with all the attendant consumer education issues to understand the value. The slow adoption of Personal Video recorders such as TiVo certainly illustrates these issues. In fact, the MP3 player itself has only been adopted by hundreds of thousands of consumers—making it the laggard among the new technologies for digital audio.

Having software at the heart of the value proposition for consumers makes the P2P situation fundamentally different than those faced by the entertainment industry before. It may seem like VCRs emerged overnight, but, in fact, the movie industry had years to try out new business models and to develop new release windows for video. In the few weeks since the Recording Industry Association announced that it would begin gathering evidence for suing individuals for file-sharing, there have been several modified P2P programs released that provide greater anonymity, encryption, and blocking of IP addresses of those organizations working on behalf of the music industry. This rapidly shifting technology landscape is forcing the entertainment industry to respond in far shorter timeframes than they had to previously.

3.2.2 The Internet Enables Massive Distribution

The second key difference in this wave of technology is that a single individual with a copy of a piece of copyrighted content can promulgate that file to millions of others throughout the world. In the past, friends made 'mix tapes' for a few friends in the neighborhood or their dorm. More recently, people made 're-mixed' CD's of the songs they liked and gave them to their acquaintances. But the unauthorized distribution of this content depended on personal contact (even if by mail). Making one's files available on a 'shared drive' is fundamentally different with files of popular content propagating across these networks in a matter of hours or days. Recently, one person obtained a pre-release copy of the 'HULK' and that file became the 'seed' for thousands of copies in just a few hours. Moreover, the ability to provide access to millions of other people one does not know directly who may be located literally on the other side of the planet represents a fundamental shift.

3.2.3 Public Attitudes

The third key difference is in the public's perception of file sharing. In the past, the individuals who offered hundreds or thousands of copies of counterfeit CD's invested in the specialized equipment to make those copies and clearly knew that they were breaking the law. Those people who bought the CD's on the street corner may have thought that they were only getting a 'good buy.' But the people offering the content had no misconceptions about the morality of their behavior. But file sharing has created a different dynamic because of several factors:

- The ability to indulge in this behavior in the privacy of one's own home (or dorm room) with what up until now have been virtually no consequences

- The lack of exchange of a physical product

- The sheer desirability of having access to virtually every song in the world

Edison Media Research's recent survey asked people who had purchased music CD's in the past 12 months if they agreed with the following statement: 'There is nothing morally wrong about downloading music for free from the Internet.' In 2002, 74% of 12-17 year olds and 59% of 18-24 year olds agreed with that statement [9]. This belief may be reinforced by a fundamental ignorance by millions of people about the business arrangements supporting these networks. According to Ipsos- Reid's survey of over 1100 respondents, downloaders do not believe that their

behavior is hurting artists. Despite the significant educational efforts by the content companies, only 20% of downloaders age 12 and older agree that free downloading and peer to peer file trading hurts artists. Only 9% feel that downloading free music off the Internet is wrong and almost 40% agree that making copies of music to give to friends is OK. [12]

It is possible that many users may be misled as the legality of their actions by the extensive paid advertising included with P2P applications.

It is worth noting, that the recent educational efforts by the industry, along with more stringent enforcement on campuses and in enterprises, may start to have an effect on these opinions. The media coverage of the RIAA seeking subpoenas for those infringing copyrights has been extensive. Major media outlets have advised individuals how they can modify the settings on their p2p software to stop 'uploading.' Forrester Research has asked downloaders how the industry's enforcement efforts might change their behavior. More than two-thirds of downloaders agreed that 'if there were a serious risk that I would go to jail or have to pay a fine for downloading music, I would stop.' [10]

In recent weeks, the number of people accessing the most popular file sharing networks has shown a significant decline. NPD's MusicWatch projection of the number of households acquiring music files reached a high of 14.5 million in April of 2003, but fell in May to 12.7 million households and declined again in June to 10.4 million. The total music files acquired also dropped from a high of 853 million files in April to 655 million in June. [13]

So perhaps, the tide is beginning to turn. Then again, perhaps it is only a sign that millions of people are already seeking out the 'next big thing' in file sharing. This area remains quite dynamic and any number of possible scenarios for the future could play out for the content companies and music and movie fans.

4. SCENARIOS

Now that we've outlined the current situation, let's explore some scenarios for how these issues could play out in the future.

4.1 Scenario: Digital Anarchy ('Ukraine' – Emma Goldman Wins)

The networks make technology improvements that render current enforcement and tracking methods ineffective. This makes it impossible to monitor or to control file sharing, so millions more people share files freely, without fear of any consequences. We call it Ukraine not out of disrespect but the opposite – Ukraine proved itself to be a place where technologists strive and can break almost any legal protection. In the Ukraine, CD/DVD piracy is in the high 90 percentile, trailing only India and ahead of China. It is dedicated to Emma Goldman the first and most famous anarchists of them all.

Technology: Advances in p2p technology (e.g. FreeNet or EarthStation5's encryption, protocol cloaking) will make it far more difficult if not impossible for a third party to monitor file transfers or to identify participants thus making enforcement much more difficult and expensive. To be widely adopted, the secure p2p networks would have to become as effective and easy to operate as the insecure networks. The result of widely used, secure p2p file sharing networks would be that copyrighted content could be exchanged freely without any fear of enforcement.

Legal: Because enforcement is close to impossible, legal strategies haves no practical impact except in some controlled environments, such as corporations, where liability issues can be used to set policy, even if the policies are difficult to enforce.

Business: We can look to countries with (effectively) no IP protection laws (e.g. China, India, Ukraine) where rampant piracy makes it impossible to sustain a legitimate content business based on product sales, so (for example) there are virtually no native Chinese stars; the artists that tour in China are actually from Taiwan or Hong Kong, where there is a legitimate music business. The major record companies have reduced their marketing expenditures in these countries as any promotion simply drives sales of illegal copies with no commensurate revenues.

For the artists, the problem is that without any legitimate music business on a global scale there is no way to become a 'star' who can then negotiate sponsorships, sell out concert tours and T-shirts. So if the whole world is like China, there's nowhere else to come from.

The labels couldn't survive as they currently exist; they scout, record, manufacture for and promote artists in return for CD sales, with no rights to revenue from merchandising, concert ticket sales, fan club memberships, and so on. Now, the demise of the major recording labels will not set too many people into uncontrolled agony. However, while some artists will record due to 'pure love of music', they will not be able to sustain themselves living on their art. We are likely to see a new bread of creators that will work for corporations, ad agencies, political campaigns, etc. to sing for-cause and other venues while recording for fun. The new model of an artist will be 'Joe Isuzu' which claimed fame as a result of a commercial. At the end, the move to purify the art will kill it. This of course applies to music, movies, books, etc. Dark ages are coming!!

Note: Physical piracy would still be illegal, so there would be some legitimate CD sales even if there were rampant online piracy, though as the digital generation takes over physical sales will represent a significantly smaller share of the total demand for music. Also, fans will want to support the bands –and while buying T-shirts they may also buy collectible CD's even if they could download. In Taiwan and Hong Kong, enforcement has moved the pirate stores into shacks in questionable parts of town, to help shore up the legitimate music sales. However, in India CD's are created in the store while-you-wait and while the governments in China and other places are paying lip service and have televised raids, the CD/DVD market of Kowloon (Hong Kong) is an open space market.

This is however not so relevant as no artist will be famous enough to sell any merchandise – in this case the egg does come ahead of the chicken

4.2 Scenario: Donations ('Utopia – Locke wins')

The music industry gives away music, and people donate to the musicians out of their goodwill. We name it after John Locke, one of the original believers in Utopia on Earth and in Human natures being good at birth.

Technology: Current technologies are sufficient, though one could imagine some improvements: the addition of a 'donate' capability to music players, and perhaps a 'micropayments' mechanism to move money more efficiently than the credit card networks.

Legal: All current copyright holders would stop enforcing all of their copyrights on digital media, which probably could weaken their copyrights on physical media as well.

Business: The theory is that the consumption of music grows, and thus there are more and more fans donating money to their favorite artists, buying T-shirts and going to their concerts. The reality is that people can currently get music for free, and could donate to musicians, if they wanted to, and they do not do it in any measurable numbers. There have been some small scale experiments with a 'virtual' tip jar on Internet sites, but the reality is that more money was raised voluntarily to pay the fines for the college students who settled with the RIAA this spring for running Napster like networks. And even then, the funds raised totaled approximately $15,000.

Stephen King, the king of Horror and one of THE best sellers of books attempted to write a book based on readers' donation. The idea was simple – every month he will publish a new chapter on the Internet and as long as 10,000 people donate $1 each, he will continue to write the book. Mr. King ceased writing after chapter 4. So, in the entire Internet world wide, this author which seemed until this point (and after when he switched back to the old model) to sell a minimum of 5,000,000 copies of each of his books could not convince 10,000 people to pay one dollar.

There are areas where donations are successful, such as where people contribute to something of great social value (e.g. the Red Cross), or are in a social setting where donations are expected (e.g. donations in a church or at a political rally), or where donations are rewarded socially (e.g. donations to PBS). Note that for downloading music, these dynamics do not appear to apply.

Thus, the music industry goes from a global business with superstars, to musicians begging in the 'cyber-park'. Without substantial revenue streams, there is no scouting for talent, no promotion and no professional production. Perhaps the medieval system of patronage (or the corporate equivalent) could support a few artists. Although artists who can command such patronage are far more likely to be well known already than of the struggling variety.

For the artists, this would mean that all artists would be 'independents' – artists might prefer to have a deal with a major record label but those entities are no longer around with sufficient resources to sign such deals. Furthermore, the infrastructure of professional producers, musicians, and recording studios would atrophy making

For the labels, there's no future, since there's no return on the investment.

Conclusion: This is the world-view the P2P supporters promote. There is no doubt, some of them honestly believe in the Utopia. Unfortunately, facts suggest that this Utopia will end up like the early attempts of Utopia in other areas – a total disaster. Some 'idealists' who view the major record companies as evil may view this as a desirable option, but the fact is that without a sound financial foundation, the industry would devolve into a vast series of 'garage shops' without the scale to create and to market music to the world.

4.3 Scenario: Compulsory Licensing ('USSR will rise' – Sir Humphrey Appleby Wins')

Consumers gain access to an unlimited supply of downloadable music (and movies, software, etc.) in return for a flat monthly fee on all Internet users. Dedicated with love to the late Nigel Hawthorne the ultimate civil servant and great defender of bureaucracy, which passed away two years ago.

Technology: Since broad distribution is licensed at flat fee (e.g. a surcharge on monthly ISP bill or college fees), incentives to

develop completely secure p2p networks are removed. However, there would need to be accurate measuring systems to support any sort of usage-based payment model. For example, for every file downloaded the appropriate label or artist would need to be credited. Or at the very least sophisticated sampling techniques would need to exist to ensure that the payments are roughly accurate similar to the approaches now used for music performances in bars and restaurants.

Besides the obvious bureaucratic show stoppers the question is 'who pays'. If it is the user – how do you identify a user in an encrypted IP address world? How do you identify the downloaded file uniquely?

The system would be vulnerable to being 'gamed' in a variety of means: both on the side of the labels who will try to maximize the count and by whomever is supposed to pay (ISP? P2P? User?) which will aim to eliminate any count at all.

These issues could be addressed, but would require a sophisticated p2p network to provide a trusted distribution mechanism, or a trusted statistical sampling system to ensure payments are accurate. Perhaps the operation of a controlled, legitimate music service that would replace all current p2p networks with licensed content. However even if some of the largest P2P networks were to 'convert' to legitimacy, there will be new networks that emerge that refuse to 'play by the new rules.'

P2P networks would need to remain relatively 'open' in order to allow for monitoring of usage (see business issues). If the licensing is for music, p2p networks would need to be blocked for sharing movies and applications (for example), or some other arrangement made. As they have no incentive to do so today, they will have even a less incentive to do so in this future. The out of US headquarters will be used to justify non-compliance and since you can't prosecute overseas, the war will not cease; it will just shift geographically. The producers of EartStation5 are based in a refugee camp on the West Bank where copyright laws only apply to Palestinian content and they are already daring those trying to enforce copyrights to 'come to the camp' to find them.

Without viable control and measurement mechanisms, simply charging by the 'byte downloaded' would fail miserably as all forms of content—whether the most recent Harry Potter novel or the top movie at the 'box office' —will be flowing through the same networks.

Legal: Requires compulsory licensing of content (i.e. from the artists to the labels) for this purpose, and agreement on a revenue sharing model. Without this compulsory licensing, the current situation (per-artist negotiations) would make this model unworkable, as the networks would have to block individual artists' work based on their current licensing status. It is important to note that many artists such as the Beatles and The Dave Matthews Band have resisted efforts to release their music into the current legitimate services for a variety of reasons. Compulsory licenses would make decisions for these artists in direct opposition to the positions that they have taken to date.

Business: Availability of music at a flat rate (and a guaranteed, but fixed income stream to labels independent of production of new hits) removes many of the incentives to create new music; instead the media companies' incentives would be to capture their percentage of the revenue stream as cost effectively as possible. Indirectly, a 'hit' could drive increased adoption of Internet access, increasing the revenue in the system.

This model would completely replace CD sales, legitimate and online retailers which today totals approximately $32B.

In the Pew study referenced earlier, current estimates place the population of U.S. music downloaders at 35 million. If every one of these downloaders availed themselves of a system with compulsory licensing at a rate of $10 per month, this would result in annual revenues of 4.2 billion dollars, which represents only 25% of the current U.S. music market. And needless to say, the chances that all music downloaders could be made to participate seems like a fairly aggressive assumption. Thus, to work, a broader base of users (e.g. all ISP customers) would be forced to subsidize the active file sharers.

The model would need to have a formula for dividing the revenue stream between the music producers. While this is currently done in some cases (e.g. the 'tax' on the sale of blank cassettes) this is a fairly small number that can be apportioned based on 'brick and mortar' music sales that can be easily measured. If all music sales are replaced by compulsory licensing, then there's no actual market for music that could be measured in order to form the basis of allocating the revenue. This could be addressed either by allocating the revenue based on the (presumably dwindling) CD purchases, or by using market share numbers from one of the P2P market intelligence systems.

There are a number of problems with allocating digital music revenue based on CD sales. First, the CD sales would continue to drop over time, making them less and less meaningful (imagine using single sales to determine the revenue sharing of CD sales now). Second, we know that CD buyers and digital downloaders are quite distinct in terms of demographics and musical tastes, so allocating money based on CD sales would penalize artists that sold better as downloads than as CD's, and overly reward artists that sold better as CD's than as downloads.

The major problem with allocating digital music revenue based on downloads is that there is no precise means of measuring user behavior on the networks, and there is no general agreement on valid statistical mechanisms that can be applied to p2p data. Indeed, many people argue that given the architectures of the p2p networks, it is not possible to gather statistically valid data on user behavior. And, of course, since all revenue for the entire industry would be driven by some sort of sharing formula, that formula would be the subject of never-ending negotiations and disagreements. The result of this ambiguity would be ongoing contention over the allocation metrics and formulas, none of which benefits artists or the music industry.

Finally, this would effectively put a cap on the total revenue of the music industry, with the only growth path being shifting market share. Thus, a huge hit album that in reality grew the market for music wouldn't be rewarded for that, but would simply result in revenue shifting within a fixed quantity. So while any one label would benefit somewhat from producing a 'hit,' the winning strategy for the industry as a whole would be to maximize ROI by minimizing expenses and cash their guaranteed revenues.

For artists, this could open up the opportunity to effectively distribute themselves digitally with almost no resources (no need to operate a storefront, do a deal with CD Baby, etc.). Of course, they'd still need to promote themselves independently of the labels. All of this is subject to the sharing formula, of course. It would eliminate CD sales as revenue to independent artists, which could hurt them as well, because an audience of 100 downloaders (where you get a share of their monthly fee for one month) would probably generate less income than an audience of 20 CD buyers (where you get $20 a CD).

For the labels, the incentive would be to produce acceptable music with as minimal an investment as possible in production, marketing, etc.

Conclusion: this is a civil service dream – total bureaucracy, undefined specifics, impossible to implement, guaranteed jobs for many administrators… If the current legal and technological strategies fail, the content industries may be forced to consider such a radical option, but the likelihood of that occurring any time soon is quite remote.

4.4 Scenario: Loose DRM ('Joe Torreli's 99 cents bargain shop ')

Buy tracks for 99 cents, and do pretty much anything you want with them (except directly share them onto p2p networks). Dedicated to Joe, whose 99 cents store had no item costing more than $2.

Technology: Loose DRM would serve as a 'speed bump' to deter honest users from stealing, and would not attempt to serve as a 'Maginot Line' around content. Thus, users could burn CD's and transfer music to portable players without complicated authorization mechanisms, surcharges, or rules to follow. Given that this is a simple model to implement, all of the complicated schemes that give content producers elaborate control over media would disappear or be stripped down in order to simplify the user experience (i.e. to match Apple's FairPlay).

In terms of the numerous DRM technologies, the best possible result would be that the companies cross-license all of the DRM technologies. This would be analogous to the situation with audio and video CODECs, which is that for the first few years companies with a compression technology, for example, would attempt to sell a 'complete solution' with stand-alone authoring tools, delivery mechanisms and player applications. Eventually they learned that they were better off settling for licensing fees from a broader market, so now all major CODEC's are integrated into all major authoring tools and players (e.g. Windows Media Player, QuickTime, RealMedia) so that authors can generate, and users can play pretty much any audio or video format using nearly any major tool. The DRM vendors are still attempting to sell a 'complete solution' but the market is evolving to the point where they will be forced to shift models in order to enable the market to grow. Ultimately, all player tools must be able to play the music from all the vendors.

Legal: The loose DRM allows users to do certain illegal things, so legal mechanisms would still be used to control extreme abuses, and to discourage participation in illegal file sharing. For example, RIAA's current legal strategies would continue to be applied to discourage participation in p2p file sharing networks, and to attempt to shut down the most blatant file sharing web sites and networks.

Business: Thus far, this model appears to be the most successful (within the market where it's been applied). If all vendors provide comparable pricing and usage options, with interoperability of media formats and players (see the 'Fragmented' scenario, below) the result could be that the digital music market could grow substantially. Of course, in the current environment anyone selling music is still competing against free (e.g. selling water) but it appears that honest people will pay for a high quality, well organized, well presented product even if they could scrounge and find it for free.

There's still the issue that some artists refuse to permit their music to be legitimately downloaded, driving their fans into the illegal

file sharing networks. For the legitimate digital music services to be truly successful, the artists must agree to allow their music to be sold to their fans.

The current US market worldwide market for music is approximately $12B. If the average track sells for approximately $0.90 (representing an average of the $0.99 per single track and the somewhat lower cost per track when a digital album is purchased), the industry would need to sell over 13B downloads per year to maintain the current revenue stream. This represents over 1B downloads per month. The Apple iTunes store, which of course addresses only the Mac market, has experienced sales of perhaps 3M units per month. Even if the PC based stores are able to duplicate that level of sales for the remaining 95% of the US market (a highly unlikely outcome), it would result in only 60M units per month —a shortfall of over 90% relative to the current revenues. Over time, there may be efficiencies in digital distribution that yield somewhat improved margins, but not at the level to compensate for this difference.

Conclusion: This is the best digital option for the artists and labels. However, this scenario still assumes a mainly Lockeian world – in other words, given convenience and reasonable pricing, people will choose to be honest. A combination of the carrot and stick will have to be carefully balanced to make this scenario work. And given that we have had a single successful model in this space for only a few months that is addressing a small minority of the marketplace who use Macs—it is really far too soon to tell if this will situation will indeed prevail.

4.5 Scenario: Rigid DRM ('Djugashvili' – Hobbes wins)'

Content creators have absolute control over the usage of all content. Dedicated to Thomas Hobbes who believed humans are basically selfish creatures who would do anything to better their position. Left to themselves, he thought, people would act on their evil impulses. He did not refer to music downloading, we think…

Technology: All content is encrypted and locked in all forms so that it is impossible for anyone to create a digital copy. Thus, secured music can only be played on secured PCs, secured portable players and played on secured speakers and cannot be burned to a normal CD. Of course, people can still record the audio signal (the so called 'analog hole'), and as soon as a single clean copy has been produced it can be distributed digitally. However the content creators or IP owners have the legal rights to go after any violation with all means possible – thus virus infection, involuntary scan of people's media and immediate prosecution will limit the creation and dissemination of such files.

Generally the 'Maginot Line' comes to mind – it might have been impenetrable, but since it was easily bypassed, it didn't matter how 'secure' it was. It's well known in the security industry that can be no absolute security, making efforts to implement elaborate security schemes a waste of resources.

Legal: If content providers achieve absolute control over content, a number of competing rights must be resolved. Fair Use issues must be resolved or dissolved; is it legal to sell content in a format that prohibits fair use? Since a work falls into the public domain after 75 years, is it legal to publish it only in an encrypted format that remains encrypted forever, or which self-destructs after an expiration date preventing it from actually becoming available? If an encrypted document is evidence in a legal investigation, is there a mechanism for unlocking it against the wishes of the author? What if the vendor goes out of business (e.g. DivX) – is it

legal for all of the music that they sold to self-destruct? The laws relating to IP are quite vague – the actual policy is defined as much by court cases and the written laws. Under loose DRM there is the flexibility to work around these cases; under rigid DRM, every situation must be anticipated and allowed for. And once the DRM policies incorporate all of the exceptions that will be required, is it still secure from prohibiting everything else?

Business: Since all content is completely controlled by the publisher, this gives maximum opportunity to make money by providing various distribution models (e.g. '$1 more to burn track to a CD' or '$1 to buy an album for a day, $15 to keep it forever'). On the down side, it would require everyone on the planet to replace everything that they own related to music, and to accept usage restrictions that have consistently failed in the marketplace thus far. The result of attempting to deploy such a system would be to irritate legitimate customers with awkward limitations, and to encourage piracy, since the pirated 'product' would not only be free, but would be a superior product of more value to the consumer.

Conclusion: Market and technology experience already have proved that this can't be implemented, however a variation of this scenario may be implemented as a reaction to the inevitable failure of Utopia or USSR-will-rise or the devastating impacts of Ukraine.

4.6 Scenario: Fragmented Market ('Chaos Theory and Fractal Geometry')

We keep doing what's going on now: each retailer, label (or even artist) uses its own DRM solution (or not), business rules, players and distribution channels so listeners would have to do individual deals with each artist or label on unique terms. And nobody could (legally) download the Beatles, for example, that don't allow their music to be sold digitally. Thus, the p2p networks, which offer everything not only for free but unencumbered by confusing usage restrictions, would remain the dominant digital means of distributing music.

Technology: competition is usually good, but in this case the resulting confusion is holding back the market. Consumers need to install multiple players, each with their own DRM systems and associated retailers. You can buy music from the iTunes Music Store and play it in iTunes or an iPod, you can buy music from Liquid Audio in Liquid format that only plays in the Liquid Player, or buy music from a number of retailers in Real Audio or Microsoft's Windows Media Audio (WMA), which might or might not play in various players (though Windows Media Player plays WMA's, and Real Player plays RealAudio, and sometimes the reverse), or transfer to various portable audio players, depending on the options chosen by the content owners, and what versions of which technologies have been cross-licensed and correctly implemented. And some kids buy Hit Clips!

Legal: The current situation.

Business: Even if the technology confusion is somehow solved, there will still be confusion in terms of usage rules and pricing. Every retailer has its own usage policies and pricing, from subscription based on pay as you go and any number of combinations. Some retailers, such as BuyMusic.com, can have different pricing and usage policies on every track in the store. This is a complete mess. Since there's so much confusion over formats, pricing, platform, etc., most people stick with the things that they know work: plain MP3's.

Conclusion: the fragmentation would clearly inhibit sales, but the marketplace would ultimately resolve down to some winning model.

5. Conclusion

Clearly the world isn't going to transition neatly to any one winning scenario; the reality is that the world is fragmented, and will remain that way for an extended period of time. The dynamics of consumer behavior, legal decisions, and technology improvements will guarantee that. Many millions of people will continue to purchase CD's, and there will almost certainly be a mixture of legal services going forward that will continue to compete with 'free: music available through other services (if the consumer is willing to take the risk to save money)

That being said, the transition is already upon is, and there may be less time than you may think. Gary Trudeau has summarized the cultural gap between parents and children on the issues of file sharing in his Doonesbury cartoons earlier this year. (http://www.musicunited.org/8_whatothers.html)

As an example of a transition from physical to digital media, consider TV Guide. For many years now, TV Guide's print magazine sales have been said to correlate exactly to the mortality rate of middle-aged women in the mid-west (their core readership). They faced an absolute generation shift in which they could gain virtually no new customers. Above a certain age, TV Guide magazine *is* how you know what is on TV, while below that age, *all* of their potential customers used electronic program guides. TV Guide's solution was to merge with an electronic program guide service (Preview).

If the music industry is facing the same sort of generational transition, their situation could be even more extreme, since music buying is even more concentrated in a single group (18-24 year olds). Instead of having the decades of declining revenue that TV Guide had in which to accommodate a shift from print to digital media, the music industry could be facing a seven year transition from physical to digital media.

There are steps that all the parties can take to encourage the emergence of the most constructive digital scenarios.

- The labels can provide a coordinated clearinghouse of rights to music, with clear and consistent pricing and usage policies, so that legitimate retailers can do business without having to negotiate with every individual artist and label (a process that has prevented any legitimate music service from being truly competitive, but employed numerous lawyers).

- The artists can agree to allow their music to appear in digital formats, with reasonable pricing and restrictions. The reality is that they've already lost the creative control that they're fighting for – millions of people are downloading their music as singles right now. The only decision to make is whether the fans can have the option of paying for the music that they're downloading, or whether the artists will continue to drive users towards illegal file-sharing networks as the only means of downloading their music.

- The artists and labels can work together to introduce a wide variety of 'add-ons' to their legitimate offers to give those consumers who really care about those artists and opportunity to get more value by 'buying' rather than stealing. There are already many examples of such offers including:

  + Exclusive tracks in the iTunes Music Store

  + Downloads of live concerts from Phish

  + Artist fan club subscriptions, providing access to downloads, ring tones, and access to better concert seats

- The technology companies can provide solutions that are easy for consumers to use, and while still taking simple steps towards protecting the rights of the content owners. Theses solutions must be for an end-to-end experience form searching, finding, and buying music; through the download to the PC, and also including the seamless transfer to portable devices.

- The retailers can provide compelling shopping experiences, marketed effectively, moving the products that make the music industry work. Without them, there's no music business.

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