

Downloading, an indicator of a new techno-economic paradigm.

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Since 1999 the recording industries have seen a dramatic and steady decline in the sale of the compact disk or the CD, a digital format for storing and playing music that has mostly replaced other formats intended for such use.

Music file-sharing was non-existent prior to 1998 but by the year 2000 this activity had grown exponentially and was seen by the recording industry as posing potentially terminal dangers to its infrastructure. The rise of Napster, and its fall in 2001 following an accusations of vast copyright infringements from the music industry and a subsequent court order, marks the explosive beginning of what can safely said to be an entrenched battle.

On one side is the recording industry led by RIAA (Recording Industry Association of America) and IFPI (International Federation of Phonographic Industries) claiming that an aggregated decrease in CD sales from the year 1999 to date is due, in its entirety, to what has become known as illegal file-sharing or piracy. Along with large corporations in the music distribution sectors these organizations have lobbied intensely, in the public, political and legal arena.

On the other side are diverse and dispersed groups of internet users and file-sharers that dispute the claims put forward by the recording industry and keep up a robust downloading culture on a global basis. Arguments presented by this side cite exaggerated claims of loss, colluded overpricing and oligopolistic industrial structure, changing consumption requirements and indirect attempts at regulating a common ecology that is the Internet and cyber-space.

Research and scholarly work can be found to support the arguments put forth by both sides and despite recent softening of position by institutional bodies such as the DCMS in the UK and the EU Commission for Telecoms and Media, direct attempts at imposing infringing legislature on a national basis are taking place in various countries around the globe. This paper is an attempt to shed light on the current situation by outlining the major strands of a debate that has raged for a decade by viewing the digitalization of creative content and its distribution and dissemination over the Internet as a part of a technological revolution. Such revolution, as defined by Schumpeter and Kuhn, and later by Freeman, Perez, Dosi and others, is not seen as an engineering phenomenon but as a complex social process involving technical, economic, social and institutional factors that establish and become part of a techno-economic paradigm that eventually causes a fundamental change in the socio-institutional sphere.

Technological Revolutions.

Technological Revolutions, in the Schumpeterian/Freeman/Perez paradigm, show two basic features. A strong interconnectedness and interdependence of the participating systems in their technologies and markets. And, a capacity to transform profoundly the rest of the economy (and eventually society).(Perez, 2009)

The capacity to transform other industries and activities results from an associated techno-economic paradigm serves as a best practice model for the most effective use of the new technologies within and beyond the new industries, according to Perez.

„In terms of structure, each revolution includes a significant number of interrelated new products and production technologies, giving rise to important new industries. Among them there tends to be a core all-pervasive low-cost input, often a source of energy, sometimes a crucial material, plus one or more new infrastructures. The latter usually change the frontier and conditions of transportation networks – for products, people, energy and information- extending their reach and increasing their speed and reliability while drastically reducing cost.“(Perez, 2009) Perez goes on to state that: „It is the techno-economic paradigm (TEP), evolving as the new technologies diffuse, that multiplies their impact across the economy and eventually modifies the socio-institutional structures.“(Perez, 2009)

The advent of the fifth successive technological revolution arrived with the development of the Intel microprocessor in 1971(Perez, 2002), the Age of Information and Telecommunication or The Digital Revolution. This has allowed for the digitized dissemination, and the digital distribution, of information as well as a redefinition of the nature, use and role of information.

New technology systems modify the business space as well as institutional context and culture. New rules and regulations are likely to be required, as well as training and institutional facilitators and these, in turn, have a strong formative influence on technology.

This paper argues that the current age of digital technologies and communication is indeed a technological revolution and that the debate over file-sharing and it's calamitous effect on the recording industries is a lucid example of a resistance to change.

Changes in CD sales.

The CD or the Compact Disc became commercially available in 1988 and has, by 2009, become the standard physical storage medium for audio. It was originally developed to store sound recordings exclusively but it's use has been extended to allow the preservation of other types of data. The MP3 file is a digital audio encoding format, a common audio format for consumer audio storage, as well as de facto standard of digital audio compression for the transfer and playback of music on digital audio players as well as personal computers. MP3

files appeared in the 1990s and by 1998 they were becoming the most popular form for encoding by producers of hardware, producers of music and users of both.

Products produced by the entertainment industry are, essentially, digitally transmittable information or as Paul Romer (2002) explains „The fundamental good produced by the recording industry is literally a bit string, a long sequence of 0's and 1's....However, once the bit string exists, it can be reused, at no additional cost, to make copies for millions, even billion of people.“ With small to no replications costs (and high fixed costs which inherently poses incumbent strains on production) it was only to be expected that downloading would take off with the diffusion of the requisite technology, a technology that sharply reduced the technical limitations that had kept the effect of pervious copying technologies at bay.

Evidence of decrease – claims, facts and predictions

Reports of the effects of file sharing are at a variance. A convincing number of studies, based on various methods to measure the drop in CD sales, number of networks and users, number of files shared and items downloaded and more, witness to a drastically changing approaches to appropriation of recorded music. Most, if not all, agree with the fact that a sustained drop in CD sales represents a lasting change in the market for recorded music and that the decrease in sales is of such magnitude that it will cause a permanent shift in the market. The variance, however, is in the causes to which this shift is attributed.

Claims:

Since the appearance of Napster in 2000, and later other P2P networks the recording industry, led by RIAA and IFPI have attributed the decrease in CD sales worldwide to illegal file-sharing activities. Estimations of diminution of revenue ranged from severe to predictions of near annihilation. According to the industry, music file sharing explains most of the 21% drop in US CD sales over the 2000-2003 period. (N. Curien, Laffond, G., Laine, J., Morau, F., 2004) Today, in 2009, following a sustained drop from 2003 the recording industry maintains that 95% of music is downloaded without payment.(IFPI, 2009) To what extent the decrease in sales translates into loss of revenue is uncertain, such information is not readily available and the little there is are figures presented by the RIAA and IFPI. The popularity of the DVD has grown and sales have increased considerably in recent years. Although the drop in CD sales is unquestioned it is likely that both consumer surplus and changing modes of consumption may partially be transferring revenue from CD's to DVD's.

Facts:

The music sectors registered 962m units physical music sales in 2004, compared with 1.13 bn. in 2000.(EC, 2008) In the year 2007 physical music sales were down to 450.5m and 362.6m in 2008 that represents a drop by 20%. The compounded annual decline of album sales was 5.59% from 1999 through 2003. From 2004 onward, the rate of decline was 13.2%, including a

2.8% increase in 2004.(Coolfer, 2008) Music sale revenue was US 14.6bn in 1999 as opposed to US 10.1bn in 2008, and an estimation of US 9.2bn in 2013. (Arango, 2008). Digital sales have increased on an annual basis, rising 32% between 2007 and 2008 to a record 65.8m units in the US but a 25% compounded over six years internationally. Digital sales in Europe were at 120m Euro in 2005 but are expected to grow to 1.1bn by 2010.(EC, 2008) Digital platforms now account for around 20% of recorded music sales.(IFPI, 2009) Single track downloads accounted for 1.4bn units globally (up 24%) in 2008 and are seen to be driving the online market although digital albums are growing in sales as well (up 37%).(IFPI, 2009)

Contributing factors to decline.

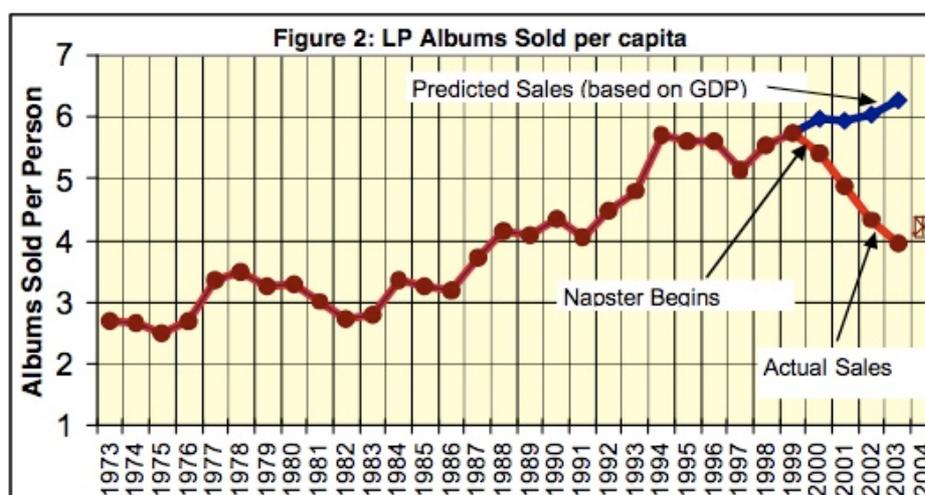
The Recording Industry places the responsibility for most of the average 7% annual drop in sales on file sharing, which they claim generates a replacement effect where free music and CDs are seen as substitutes. The concomitant occurrence of decrease in sales with growing distribution of broadband has been use to support this. Most scholars support the statement that downloading is responsible for some of this decline but disagree on to what degree other factors contribute to the decline in sales.

In line with a hypotheses of a techno-economic paradigm shift, with the accompanying adjustments of institutions, markets and business, it is only right to assume that the underlying causes for the decline in CD sales are more than mere substitution effects. Such a claim must include the logic that a systemic change is taking place that reflects more than just a shift in the use of format. Suggestions of contributing factors range from the technological to the economic, social, cultural and market based.

Technol. factors:	Economic factors:	Social factors:	Cultural factors:
Capacity to copy CDs by burning	Changing or poor economic conditions	Resistance to industry copyright enforcement acts	Easy access to multitudes of creators
The Library Effect or the substitution between vinyl (LPs) and CDs	Excessive or monopolistic pricing or the perception there of		Growth of competing cultural products ex. DVDs
Availability of vast libraries of music from online sources	A single song market – the iTunes effect. Rejection of product bundling		Poor creativity of new CDs
Easy access to online radio that include highly style specific broadcasts	Fewer stores, Top Chart inventory		

Figure 1. demonstrates a peak in sales of pre-recorded music CDs in 1999. This coincides with the massive distribution for copying technologies for general customer use and the rise of Napster. In accord with the technological revolution hypotheses the figure may also be deemed to express a growing participation in the transfer from the physical to the digital delivery, a trajectory which, if indeed this is a systemic technological change as defined by Freeman(Freeman, 1992, 1996), is irreversible. In such an instance it is somewhat singular to view the predicted sales (based on GDP) as a logical estimation of sale development and interpret the disparity between predicted sales and actual sales as revenue loss. That is however what the recording industry appears to be doing.

Figure 1. LP/CD sales in the USA from 1973-2004. Source: Liebowitz, 2006



„No matter how important and dynamic a set of new technologies may be, it only merits the term *revolution* if it has the power to bring about a transformation across the board. It is the *techno-economic-paradigm* (TEP), evolving as the new technology diffuses, that multiplies their impact across the economy and eventually also modifies the socio-institutional structures.

Such a meta-paradigm is the set of the most successful and profitable practices in terms of choice of inputs, methods and technologies and in terms of organizational structures, business models and strategies. Thus mutually compatible principles and criteria develop in the process of using the new technologies, overcoming obstacles and finding more adequate procedures, routines and structures. The emerging heuristic routines and approaches are gradually internalized by engineers and managers, investors and bankers, sales and advertising people, entrepreneurs and consumers. In time, a shared logic is established; a new „common sense“ is accepted for investment decisions as well as for consumer choice. The old ideas are unlearned and the new ones become „normal““(Perez, 2009)

Decline in CD sales a first manifestation of revolutionary digital consumer ship

What was not apparent during the period from 2000 – 2004 when most of relevant studies were conducted was that the drop in CD sales took place before an alternative user format or mode of consumption had peaked in its diffusion curve. It is possible that the transition period from LPs and tapes may be concurrent with the early stages of the CD diffusion. However, a break from a normal curve presents itself in 1999-2000 suggesting that a replacement product was not making an entry into the market as would be normal when a product reaches a saturation or exhaustion point. And, that when such new modes of consumption did start to surface they would not take on the form of a physical product. It appears that many of the scholars were not fully aware that they were studying a trend taking place in a technological flux and entering a period of music commerce that could not be equated to prior „situations“. In an paper that marks a departure from the common approach Paul Romer did however observe that based on the evidence at the time „the vast majority of music downloads are not directly substituting for purchases of traditional recordings and, rather, represent new consumption units for listeners.“(Romer, 2002)

What these studies clearly show is a large decline in CD sales, a somewhat lesser decline in music sales but little to no decline in music consumption.

Effects of file-sharing on stakeholders

Industry:

The recording industry has lost revenue due to the serious decrease in CD sales. It has been claimed, rightfully no doubt, that downloading contributes to this fact (Hui & Png, 2003; Liebowitz, 2003; Peitz & Waelbroeck, 2004a, 2004b; Zetner, 2003). Exceptions to this are Oberholzer & Strumpf (2004), Tanaka (2004) and Andersen & Frenz(2007) who find little or no decrease in sales attributable to file sharing.

The music industry is structured similarly to the film industry. A few majors rule the market on a global scale – owning distribution (and often all other) rights globally. A large number of independents (some owned by the majors) compete in the market, smaller in scale and scope. The majors control their own vertical value chain and compete horizontally in the market. The industry is mostly governed by the Pareto distribution law which to a large extend explains its structure – where a relatively small number of hits have to make up for a much larger number of misses. (Caves, 2002). Their products are traditionally non-exclusive and non-rival in nature but like any non-rival goods theirs come packaged together with rival goods and thus exclusivity is partly obtained through product delivery formats. This also goes far in explaining the oligopolistic structure of the industry and may render some credence to common accusations of price collusion. (Frost, 2007; Romer, 2002) This structure makes the need for control over distribution strategy and delivery channels critical and this is why the capacity for digital downloading wreaks havoc within the industry.

Since the realization of imminent calamity hit the industry, in the late 1990s, the record companies along with the RIAA and IFPI have developed a double-stranded strategy to fight off the threat, litigation and enforced partial exclusivity of their products.

Seeking damages on behalf of maltreated artists and the education of Internet users are the main justification the industry cites for numerous lawsuits filed both by individual companies as well as the RIAA. To date around 40.000 US citizens, picked at random, have been sued by the RIAA though only two cases have gone to court. The RIAA was awarded damages totaling just under \$3m as a result of these two cases but most, if not all, of the remaining 39.998 individuals accept RIAA's offer of a settlement for between \$3.000 and \$12.000 US dollars apiece.(Tenebaum, 2009)

Partial-Exclusivity. Increased copyright protection and DRMs (Digital Rights Management, a term describing any technology which inhibits uses (legitimate or otherwise) of digital content that were not desired or foreseen by the content provider) are the means through which the recording industry seeks to regain control over the distribution and consumption of their products. The implementation of DRMs has not proved successful, circumvention technologies are developed to overcome it's constraints and users have objected to it's use. In fact, large content retailers such as Amazon.com and iTunes are now using the absence of DRM as a specific selling point.

Lobbying and litigating to strengthen, both in scope and depth, existing copyright laws has been productive for the recording industry and related industries (film industry). The duration of copyright has been extended worldwide, laws have been amended and actions to regulate Internet access are being prepared the world over.

Artists:

The main motivation for artists to sign with majors has been to benefit from their superior position in marketing and distribution. As mentioned earlier, downloading affects this particular area of the industry activity the hardest and undermines the necessary control over the product. New distribution methods thus undermine the incentive artist have for signing up with large companies.(N. Curien, Laffond, Lainé, & Moreau, 2004) This increasingly applies the more firms attempt to accommodate piracy by exploiting one of its main features, a large-scale diffusion at a low cost. Concomitantly, reduced revenue from CD sales hits the large record companies the hardest, those who represent the well-known, popular artists. It may therefore be safe to assume that this group of musicians may see the largest cut in their profit although their revenue may still far outrun the lesser know artists in numbers of dollars. Blackburn (2004) concludes that file sharing does indeed depress music sales overall, but the effect is not evenly felt. The hits at the top of the charts lose sales, but the niche artists further down the popularity curve actually benefit from file trading. Duchene and Walbroek (2002) have demonstrated that P2P technologies reduce the profit of already well-known artists using the traditional distribution system. Concurrently the technology offers smaller and previously

unknown artists the opportunity of uploading their product online with little fixed cost allowing for a more widespread and rapid distribution than traditional means would. Based on the observation that the business model of major labels relies considerably on a limited number of superstar albums, Oberholzer and Strumpf (2004) conversely conclude that the impact of file sharing on sales is likely to be positive but negative on less popular artists that sell fewer albums. They conclude that this leaves the major labels ability to promote and develop talent intact and that it is not obvious that music production will be influenced by the reduced compensation for less popular artists.

It is perhaps not unnatural to assume that the power law distribution is a result of the development of the industrial structure (which again is shaped by the non-exclusive, non-rival nature of the products) and that homogeneity of choice and taste is shaped by supply and marketing rather than vice versa. Music is an experience good where horizontal product differentiation and taste heterogeneity are important. (Peitz & Waelbroeck, 2005) Therefore it might benefit greater numbers and greater variety of artists if the organizational structure of the recording industry were reconfigured.

Consumers:

Recent studies have shown that the biggest users of unlawful peer-to-peer material are also the biggest paid-for consumers of music. Other studies support these findings while at the same time confirming that the availability of free material is the single greatest disincentive to legal purchase. These studies demonstrate growing trends towards other means of appropriation supporting the common supposition that where there are easy, affordable and lawful routes consumers will take them. (Andersen & Frenz, 2007; Department for Business, 2009; Huygen, 2009; Question, 2009)

According to P2P supporters, music downloaders use downloaded files for sampling and information gathering. (Duchene & Waelbroeck, 2004). An analysis made by Peitz and Waelbroeck (2005) suggests that despite certain tribulations profits for music labels increase for a certain set of parameters because consumers can make more informed purchasing decisions because of sampling and are willing to spend for the original although they could consume the download for free.

It is generally accepted that downloading increases short total welfare due to consumer surplus exceeding loss in firms' profits and higher social costs in detection of infringement and increased copyright protection. (Chen & Png, 2002) Hui & Png (2003) have empirically supported the suggestion that, if the demand for music CDs decreased with piracy, „theft“ outweighs the „positive“ effects of piracy. An analysis by Huygen (2009) showed that the short-term and long-term welfare effects of file sharing are strongly positive given that it is practiced by consumers who lack purchasing power. In a study where supply is given in the evaluation of welfare (and where the sample was non-representative) downloading was found to reduce expenditure by \$25 per capita in the sub-sample whereas downloading raised sample

consumers' welfare by \$70 with these albums. Some of the benefit to consumers were found to be transfers from sellers but most of the benefit (\$45 per capita) came from reduction in deadweight loss. (Rob & Waldfogel, 2004) To the extent that file sharing results in a decline in sales (substitution), we see a transfer of welfare from operators/producers to consumers (demand driven by a lack of purchasing power), with no net welfare effect. On the basis that demand for music is very responsive to price, as suggested by the explosion in music file sharing, Romer (2002) has made a crude estimate (by comparing downloads to retail prices of CD singles) that the welfare loss created by the excess of price over marginal cost could be comparable to total revenue for the recording industry.

The production of music is little affected by downloading, according to Oberholzer & Strumpf (2004). If this claim holds then file sharing probably increases aggregate welfare since shifts from sales to downloads are simply transfers between firms and consumers. They argue that file sharing imposes little dynamic cost in terms of future production as it has considerably increased the consumption of recorded music. File sharing lowers the price and allows an apparently large pool of individuals to enjoy music. The sheer magnitude of this activity, the billions of tracks that are downloaded each year, suggests the added social welfare from file sharing is likely to be quite high.

„So, we are suggesting that there are two main reasons why a set of truly new technologies is able to spread in a world still amply dominated by the old. First, the signs of exhaustion of the prevailing technologies have weakened the exclusion mechanisms and, second, there are obvious changes in the relative cost structure, which are seen to be permanent and act in factor of the new technologies. So, investment in search of better profits sees a good direction in which to plunge.“(Perez, 2004)

Resistance to the new paradigm.

Recent reports written on behalf of various organizations and governmental agencies have confirmed that Internet users are adapting to new and multi-faceted forms of consumption and appropriation of digital content products. To some degree the industry has attempted to provide alternative platforms for product delivery. DRM enforced content for downloads, VoD (Video on Demand) services, single song sales through iTunes and lately, streaming services through legitimate platform providers. However, a variable pricing models for content delivered on different platforms and formats is a classic trade-off between payment and control. And control, along with the accepted presumption that the bona fide form of music transaction is on a multi-track physical format, is what the recording industry fights to retain. It's the control over the market (the recording industry has repeatedly been accused of price collusion), the control over the means of distribution and the ability to limit access of newcomers and the control to direct and shape listeners tastes and preferences which is

considered to be a vital asset of the record companies (Frost, 2007). Retaining this control prevents disintermediation, a strategy variation of the degree to which one or more actors become redundant to the value chain because they add insufficient value.

To recap, we have already cited Perez the two basic features that distinguish technological revolutions. Firstly, the strong interconnectedness and interdependence of the participating systems in their technologies and markets and secondly, the capacity to transform profoundly the rest of the economy (and eventually society).(Perez, 2004)

As the new technologies transform work and consumption patterns, they also transform the way work and businesses are organized which then establishes new principles of superior organization that become part of the new common sense for efficiency and effectiveness. (Perez, 2009) This change in organizational and business logic spreads widely and modifies business models and strategies in assimilation to the techno-economic-paradigm which is thus enriched and the process self-reinforced.

Perez goes on to point out that the process of the technological revolution to produce a techno-economic common sense, as an overarching paradigm has to overcome many obstacles encountered in the economic actors themselves. Pioneers and early adopters, will, after a period of initial growth, encounter limits to their full development within the environment of the old paradigm. The resistance, which often is internal and residing within the leadership of established firms, tends in time to be overcome by the threat to profits and growth from the exhaustion of the old technologies and practices. Particularly when seen against examples of success and even by direct pressure in the market from competitors who have adopted the new paradigm.

„The process of gradual abandonment of a declining productive model and of growing adoption of the new is not readily perceived as such. The existing institutions take a long time to grasp the all-pervasiveness of the transformation-taking place in more and more points of the economic system. Traditions, established routines and past successes with the usual practices make it difficult to capture the meaning and the threat of these successive changes as a source of institutional mismatches and problems. Even those who realize the importance of the technological and economic changes do not often connect them with necessary adaptations of their own space of influence or with a need for changes in their own behavior“.(Perez, 2004) A point made by Romer in 2002 enforces the argument of traditionalist resistance to institutional and organizational change: „Existing firms will lobby vigorously to prevent a transfer from them to consumers, but economics should stand ready to explain that the policy goal should be to maximize consumer welfare, not such popular proxies as „exports“ or „industry revenues“.

Trenches.

Many of the relevant institutions and governmental agencies have come to realize that the current situation, the ongoing battle between industry and users, is untenable. Unlawful downloading is still ongoing, possibly gaining a still stronger foothold. Neither side appears willing to back down from their position. The aforementioned agencies are increasingly adopting a mediating position – a move from a stance where a general assent with industry unremitting denouncement of file sharing prevailed. „While many right holders insist that every unauthorized download from the Internet is a violation of intellectual property rights and therefore illegal or even criminal, others stress that access to the Internet is a crucial fundamental right. Let me be clear on this: Both sides are right. The drama is that after long and often fruitless battles, both camps have now dug themselves in their positions, without any signs of opening from either side.“(Reding, 2009) In despite of this the lobbying orchestrated by the industry appears to have growing support among legislators as recent and proposed legalization of IP intervention.

For years the recording industry has been urged to develop new business models and look toward innovation outside the box of the traditional value chain. The industry has partly been responsive to this and a number of digitally centered business ventures have been implemented and tried. Others are in the development process. One example comes from Universal Music Group UK whose strategy reflects: „the evolution we will see in the UK in 2009 as we move from a digital landscape dominated by solely owning music to hybrid models where customers will access and own music as part of an existing and familiar services.“(IFPI, 2009)

However, a clear path towards an all-encompassing model is not in sight and should perhaps not be expected. A tendency to rely on known structures plus the obvious problem of not being able to work according to a model that as yet is not constructed clearly does not help. An added complication is the fact that users are changing their buying, consumption and usage behavior and no definite indicators can point to an overriding pattern or method that can provide the industry a reliable direction towards successful market exploitation. However, new business models cannot be restricted to new distribution or marketing channels – forging new alliances and combines for newly developed products and services seems to be the only way to successfully tackle the implications of file sharing for the industry, at least for the time being. As Huygen (2009) suggests that even in a hypothetical future without file sharing, a hybrid business model would appear to be the only solution.

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