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**Copying, copyright and creative destruction: The impact of digital file sharing
on the recorded music industry**

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Copying, Copyright and Creative Destruction: The Impact of Digital File Sharing on the Recorded Music Industry

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Abstract

The diffusion of radical innovation is a potentially destructive process, which forces readjustment to conventional practices, an effect we are currently witnessing with the widespread adoption of information and communication technologies (ICT). This paper follows a particular case of ICT diffusion, where the implications for an established sector are profound; it considers the impact of digital music file sharing between internet users, on the incumbent music sector.

The growth of illegal file sharing, in terms of its speed and scope, has wrought a crisis in the global oligopoly of the recorded music industry. Such activity has forced fundamental changes in its habitual defensive strategies towards technological change, including a fundamental rethink concerning the nature of copyright applied to cultural products in digital form. Immense power has been captured by internet users through a confluence of innovations in hardware and software designed to promote distributed access to MP3 music files, as well as the means to playback such files in a variety of ways.

The unmistakable impact on the incumbent recorded music sector is a loosening of its previously tightly held grip on the manufacture and distribution of popular music. This has resulted in the exposure of the complexities involved in attempting to fashion expressive cultural experiences as consumer products.

Introduction

Classical economic theory follows Schumpeter (1939) in assuming the effect of radical technological change is a continual process of 'creative destruction' by the invention and dissemination of superior technologies. For Schumpeter, this change, however harsh or unwelcome, is essential and inevitable, and could be described as the 'pulse' of a healthy economic system organized around the basic principles of free trade, market power and innovation. Great industries of the past have fallen to this dynamic, if mechanical, process of improvement and progress. Far from being seen as an outdated, overly simplistic and deterministic thesis, Schumpeter's ideas still form a cornerstone of recent theorizing about the role of technological change (Kemp et al 2001, Christensen 2001). There have been attempts by innovation theorists to mollify the harsh conclusions derived from this evolutionary perspective, predominantly either through encouraging incumbent firms to adopt visionary and risk taking strategies, or by accepting, if not complete annihilation, then retreat to a much reduced market niche (Utterback 1994, Howells 2002).

Conventional innovation models, such as Utterback's (1994) product life cycle, identify increasing organizational resistance to change as the product matures. Over time, new entrepreneurial sectors develop management skill for growth and restructuring, but the maturing technology, and associated mature, routine-based, inflexible firm becomes vulnerable to the onslaught of new, radical invading technologies with the potential to destroy the incumbent industry. The challenge then becomes one of reintroducing the 'entrepreneurial spirit' to these large, mature organizations, for example by building competence in a new technology, so 'established firms can renew their core technologies when they become obsolete' (Utterback 1994,197). The attitude of senior managers to developing and maintaining a strategy for corporate renewal becomes a key factor in the success of rejuvenating the innovative base. Dess et al (1997) suggest other conditions in which the firm may need a more entrepreneurial approach. Factors such as highly uncertain environments, for example, changing competitive situations, the need to manage threats from discontinuous technologies.

This question of creative destruction is one that has continually hovered over the recorded music business. As the twentieth century opened, the dominant system of domestic consumption of music was under threat from the new technology of the phonograph. Subsequently, as the century drew to a close amid the debacle of music file sharing on the internet, a powerful global oligopoly appeared to be tottering on the brink of evolutionary chaos. The future depends critically on the sector's response to the rapid pace of technological change that is now in progress, in terms of reasserting its control over both the production and consumption of music. In its favour lies many years experience of managing, and adapting to, successive waves of potentially destructive technologies, a process, which has enabled five trans-national corporations to establish a tight control over the uncertainties generated from the continuously creative interaction of musicians with emerging technologies (Coles and Harris 2004). This article identifies the historical process of technological change in recorded music and presents an analysis of the current crisis facing the industry in terms of the rapid growth in free music sharing software available to download over the internet.

The Music Industry and Technological Change

It is a truism to acknowledge that the recorded music industry has a century of innovation at its core, and that, contrary to other sectors where rates of change may be slow and incremental, recorded music has been assaulted by wave after wave of discontinuous technologies over very short time periods. Major firms have had little control over the rate and direction of technological change as this has often been in the form of the rapid adoption of technologies developed for alternative purposes (see Pinch 2001). In fact, strategies of entrenchment, resistance and control have been pursued not only in response to the vagaries of technical change but also the unpredictable functioning of the market. At one end the outcome of these strategies can be identified in the convergence of production technology and the management of artists' creativity in the form of 'manufactured pop' (Burnett 1996, Negus 1998). At the other end lies the uncontrollable spread of music via the internet, and the unpredictable emergence of new popular genres (Alderman 2001). Jones (1992) identifies the impact of technological change in popular music as being both concerned with business-to-business technologies for the production

of recordings and business to consumer technologies to provide recordings in formats that can be successfully replayed on home technologies. He asserts that popular music is a product inseparable from and constructed by technology and that all development of the genre is based around technological change, in fact 'the goal of getting a good sound is no different now than it was when the first recordings were made' (Jones 1992, 7). He points also to a historical interrelation between producer and consumer technologies with improvements in the former finding their way through to consumer products offering improved sound quality (see also Cunningham 1998).

The process of innovation adoption was present from the first demonstration of Edison's phonograph, which he had developed for the recording of speech, allegedly tacking music on as an afterthought (Martin, 1995). This development eventually spread through a growing consumer market for home entertainment during the early 20th century, severely affecting the then incumbent technology of the home piano and its attendant skills base. This was rapidly followed by development and diffusion of new sound technologies such as cinema projection, domestic radio receivers, and magnetic tape recording. In the post-war period, there was no slowing of innovation, with stereo, cassette tape, and more recently the compact disc all having an impact on the professional and domestic consumer. Martin (1995) links a discussion of these technologies with changes in industry structure throughout the century, particularly highlighting the growing importance of royalties, from the exploitation of copyright, as a fundamental organizing principle of the business. In a pre-cursor of the problems faced by the diffusion of the internet in the 1990s, he charts the negative reception given to the development of national network radio in the USA, and the transmission of copyrighted music in the 1930s (see also Frith 1993). A boycott of radio by the established music industry over the issue of royalty payment for each record played, resulted in a growing exposure of audiences to music which had become marginalized from the mainstream popular repertoire over time. This, Martin claims, led to a resurgence of genres such as country and western and rhythm and blues (see also Hendry 2000, Abramson 2002). He also notes that radio,

first can be seen to have presented a threat to established interests, then generated tremendous upheaval in the industry the outcome of which was a radical transformation of the character of the music made available through the radio (Martin 1995, 27).

Not only is there an implication that the industry mismanaged the issues of copyright but also that it also lacked the understanding and vision to embrace and exploit the new medium, even though it challenged established business practice (Shuker 2002). Copyright issues were raised again in the 1970s with the rise not only of home taping by consumers but also with the emergence of an industry devoted to the piracy of popular music, based in countries with weak intellectual property right (IPR) laws (Frith 2002). This situation was exacerbated by the subsequent popularity of compact disc (CD) technology to consumers (other commentators also consider the role of technological change on the artists, see for example Blake 1999, Ingham 1999, Monroe 1999). Martin (1995) asserts that the reaction by the majors has been to look for more predictable business opportunities in cinema and television, as a base to exploit existing rights rather than, 'pandering to the whims of fourteen-year-olds, exploiting the rights they already hold, rather than trying to cope with a hugely unpredictable market and constantly changing technology' (Martin 1995, 259). The efforts of the large firms, in which they tried to prevent the development of a consumer version of digital audio tape (DAT) is an example of an attempt to direct and control the process of technical change. Other practices have emerged more recently, such as digital sampling, to provide a new problem by exploiting legal gray areas in relation to what can and cannot actually be claimed under copyright. For example Burnett claims,

The future of consumer technology for recording and playing music has been a central concern of the music industry for decades. Issues concerning copyright, industry politics, and economics of the marketplace have guided the debate more than the quality a sound and consumer technology (Burnett 1996, 93)

Information and Communication Technology as a Disruptive Innovation

In the light of this background, it is pertinent to consider whether the diffusion of the internet can be considered as a potentially radical, disruptive threat to the recorded music sector. Two factors need to be considered, firstly the potential for large, mature organisations to respond to threats from innovation outside their core business and competence as well as the processes involved in adoption and use of new technologies. Drawing on an evaluation of how radical technologies diffuse over time, Freeman and Perez (1998) have identified the rapid development and diffusion of information technology (ICT) over the past twenty years, as the basis for the emergence of a new techno-economic paradigm. They envisage the diffusion of ICT throughout the economy having a pervasive impact, stimulating economic growth and competitive advantage for successful adopters. Such optimism is also tempered by the caution that these new technologies will take many decades to become firmly established, with their potential widely exploited, requiring both social learning and institutional change. However, analysis of perceived technological 'revolutions' tends to selectively focus on successful technologies, giving the implications that technological change plays an overly deterministic role in the processes of business change (Nelson and Winter 1982). Other writers have studied innovation in terms of the introduction of new ICT systems at the organizational level, and have emphasized its incremental rather than revolutionary character in adoption situations (eg Fincham et al 1994). In particular, such micro-level studies serve to illuminate the deep-seated institutional resistances that exist in organizations to the process of change, and the many opportunities that exist for the implementation process to fail (Doherty and Hardy 1996, Fletcher 1998). In general, however, the impact of new ICT systems appears to have been incremental, piecemeal and under-utilized across many different business sectors, while the possibility of radical change and long range planning have been lost (Williams 1997).

While issues relating to the adoption of business systems might explain institutional problems with the new technologies, commentators have also pointed to the commercial opportunities opened up through the emergence of the world wide web as a forum for e-commerce, which, it has been noted, raises the profile of the user, giving more influence

to the customer (Dutton 1996). Thus the challenge for successful e-commerce is to understand and exploit 'web culture', in all its anarchic freedom and popularity (Goggin 2000, Roscoe 1999). In essence, this means coming to terms with the free flow of information, which, in the non-virtual world may have a premium economic value (Harris, Coles and Davies 2003). These developments pose deep-seated problems for cultural sectors, such as music, which depend on the exploitation of existing, owned rights, one of the issues which has been identified as particularly problematic for establishing legitimate e-commerce activities, and the core problem vis-à-vis the music industry and the web.

The diffusion of ICT, its user-led nature, and the threat posed to the position of copyright was ignored by the large music firms, while audio files remained large, unwieldy and memory hungry (Coles and Harris 2004, Cooper and Harrison 2001). The advent of MP3 files changed this situation and the recorded music industry has, in general, been accused of failing to embrace the potentially radical implications of the new information and communication technologies in the ways outlined above (Haring 2000, Alderman 2001, Irvine 2001c). While there is undoubtedly some truth in this accusation, failure by the majors in this sector to embark on rapid change needs to be understood not only in the specific business context but also in its current competitive structure and global reach. Even in 1995, the rapid diffusion and use of the world-wide web was envisioned in the music business as a future means of saving on manufacturing and retailing costs rather than a fundamental challenge to the *status quo*. A slow, incremental and trouble free adoption was foreseen, as expressed by a spokesman for the International Federation of Phonogram Industries (IFPI):

'we know that some time in the future, recorded music will be widely available on-line...Our challenge is how to get from here to there with an industry intact'(quoted in Burnett 1996, 12).

Such tardiness in realizing the nature of the changes that were taking place under their noses can be explained to a certain extent by managerial resistance to react to threats to

the established business. However, as outlined above, this was not a novel situation, since this industry has been faced, historically, with similar radical challenges to business practices. In fact, the issues noted by Scarborough and Lannon (1994) relating to the role of 'historical precedent' in an organization's response to, and implementation of, new technologies may be applicable to the music industry in general.

Copyright and Digital Music

The issues relating to the threat posed by diffusion of ICT to the music industry coalesce around the contested role of copyright and its legal transfer to the new medium.

Businesses in a wide range of cultural industries support moves to extend the scope of copyright protection in digital form through an international renegotiation of the legal position regarding intellectual property rights (McFarland 1999, Spinello and Taviani 2001). However, it is important to recognize that this is not an automatic or natural transfer of rights to an ICT form, but should be placed in the particular historical context of debate over the role of copyright in the cultural industries and as a legal concept in the context of disputes over internet freedoms.

Rose (2003) studied the relationship between the emergence of copyright and the simultaneous emergence of discourse related to the 'public domain' in which 'the circulation of cultural products as commodities' (Rose 2003, 76) could enhance civil society which would become a beneficiary of a legal system of intellectual property rights (IPR). In the 17th century the concept of copyright, which recognised the position of authorship gained legal status. Thus the law placed a greater value on the primacy of ownership than free dissemination in the public domain, but it also challenged the existing system of private monopoly by firms involved in publication. Copyright essentially enshrined in law the idea that authors should exert a (temporary) monopoly in order to make gains from their labour, which was weighed against the wider benefits that would accrue to the citizen from the dissemination of an artistic work through public access. However, Rose points out that the general form copyright took was in response to a weakly articulated discourse surrounding the public domain and the public interest, recognized as a true beneficiary in the process of dissemination of the fruits of artistic

creation. He claims that persistent failure to support the concept of the public as beneficiary has resulted in subsequent changes to the law, such that ‘protection has been systematically extended to cover a wider and wider range of materials for longer and longer periods of time...the early history of copyright is embedded in the formation of the public sphere, so the later history is embedded in the structural transformation of the public sphere’ (Rose 2003, 86).

Failure to produce discourse of public rights as a counterbalance the idea of property rights is an ongoing, contemporary issue, according to Rose, so that valuing the public domain is still a process that involves ‘fashioning a rhetoric as well as a politics’ (Rose 2003, 87). Boyle (2003) also considers the changing nature of IPR and argues for recognition of the ‘artificial and controversial nature’ of property rights (Boyle 2003, 33). He draws an analogy with the enclosure movement of 18th century Britain, which placed ‘commons property’ into the hands of more wealthy landowners, arguing that current extension of the scope of IPR into digital media is analogous to an ‘enclosure of the intangible commons of the mind’ (p. 37). Boyle (1996, 2001) is opposed to reforms which, he claims, amount to the State awarding monopoly power to a small number of multi-national companies, in the USA. He points to the Digital Millennium Copyright Act (DMCA), passed in 1998, so that,

‘in a very real sense protection of the commons was one of the fundamental goals of intellectual property law. In the new vision of intellectual property, however, property should be extended everywhere....even if it is used in part to protect against fair use’ (Boyle 2003, 38).

Boyle is arguing against a view of ‘the commons’ as an inefficient and poorly managed resource, by supporting the view that the internet is a digital version of a commonly owned space, where lack of regulation is of public benefit, while digital technologies blur the line between listening, and copying. In addition, both Boyle (2003) and Lessig (2001, 2002) put forward the argument that the IPR law (especially in the USA) is now putting up barriers against the generation of new ideas and innovation. Lessig (2001) accuses the

courts and corporations are attempting to 'wall off cyberspace' through an extension of property rights posing a threat to continuous experiment and innovation. He notes that the idea of a digital commons was built into the architecture of the original network and copyright owners certainly are entitled to compensation for their work, but the right to compensation should not translate into the power to control innovation. He points out, the continual extension of the concept of 'ownership' of a work is less and less related to the original idea of 'authorship', as firms take control of copyright in commercial situations (see also Warwick 1999).

In addition to the changes to copyright provision in the USA, there have been similar moves in Europe, such as the EU Copyright Directive (EUCD), which stops consumers circumventing copy protection technology, for example that incorporated on a music compact disc to prevent play on a computer (Keegan 2002, Midgely 2002). The EUCD is designed to extend protection for copyright owners, particularly against illegal file sharing in an attempt to control how consumers use the internet. However, the EUCD has been delayed so that by February 2003 it had only been ratified by two countries (Timms 2003b). Even though such technologies interfere with established practice in Europe regarding 'fair use', allowing the music consumer to make one copy for personal, domestic use, the EUCD follows the DMCA in making it a crime to break encryption technology (Lillington 2001). Timms (2003b) points out that these laws take no account of intent of use, and have led to the establishment of digital right protection organizations, such as the Electronic Frontier Foundation (EFF) in the USA and the Campaign for Digital Rights in the UK (EFF 2004).

The diffusion of file sharing software

For the global music industry the problem of copyright protection came to the fore with the advent of Napster the first free software put on the web to facilitate music sharing via the MP3 format (Coles and Harris 2004). Aggressive use of legal action in the USA by the major corporations through their trade association, the Recording Industries Association of America (RIAA) forced Napster off-line but this only appeared to fuel development and diffusion a new wave of file sharing programs, resulting in an

escalation of the problem (Hoskyn 2001). Napster demonstrated the ease with which such sites could be accessed and fuelled the introduction of others, starting, 'a revolution in the way we listen to music' (Bresnark 2001). MP3 soon became the second most popular search term on the web (Allen 2001). However, where Napster had a database of files uploaded onto a central server, which became the eventual cause of its closure, the new programs are 'decentralised', connecting all computers into a large network directly, known as peer-to-peer (p2p) or 'file sharing' (Schofield 2001). Legally individual users are potentially at fault for accessing copyrighted material, analogous to the position with home taping (Allen 2001b). A particular program named Kazaa rapidly emerged as the most popular of the new p2p programs.

Widespread access to p2p programs was immediately seen as a fundamental challenge to the economic status of copyright ownership by the industry, making it difficult to trace the infringers. Robert Young, Chairman of Linux Software Company, is quoted as commenting on a technology that 'is really giving users control over information and resources' (Lillington 2001). Every computer becomes both a receiver and broadcaster of content, distributing power to the edge of the network. Ian Clarke, inventor of Freenet, a p2p network, was reported to believe that p2p linking users into a giant anonymous web is what internet pioneers intended, (and that the 'free commons' commentators argue for), while users persist with a huge 'file swapping experiment' (Music Week 2000). In 2001 there was a rapid growth in popularity for the new file swapping programs, which had grown to much larger volume than Napster and was proving much harder to target with legal action. Copyright infringement problems for the music industry were exacerbated by the commercial availability of MP3 players, CD rewriters, and high quality PC speakers. A business report on the phenomenon, noted that p2p users wanted to use their technology, not hindered by slow software or high prices for music tracks (Birch and Davidson 2003). Other industry analysts noted that the advent of Kazaa had changed the access to music to little more than a 'transfer of data', and that a business model for the web should acknowledge the reduced value of digital information. While the industry retained its retrograde stance, p2p users seemed to create a new cultural space for music consumption, with Kazaa users creating and sharing playlists with others, while large

music firms lagged behind, and using a business model antagonistic to the technology (Stewart, 2003).

Kazaa rapidly became the world's most downloaded program (Birch and Davison 2003). However, it soon became clear that the founders of Kazaa were both organizationally as well as technically innovative. As the combined weight of the established industry attempted to bring legal proceedings to close it down, Niklas Zennstrom, co-founder of Kazaa disappeared, and the company reappeared somewhat mysteriously with a decentralized structure, known as Sharman Networks (Borland 2002). This enterprise reportedly has its servers located in Denmark, software in Eastonia, while the domain is registered in Australia. The Corporation could be found on a tiny island in the South Pacific, Vannuata, famous for secrecy and a known tax haven (Woody 2002). Far from embodying the anarchic free-for-all of the internet, Sharman was described as, 'an international business model for the post-Napster era', with 60million users around the world and 22million in the USA (Borland, 2002). Furthermore, it appeared that Sharman had found ways to profit greatly from the global volume of downloading activity, through advertising revenue, as well as technological developments of both its 'Kapsule' technology which can incorporate adware into files and an encrypted version of Kasaa which could be used for legitimate activities (Woody, 2002).

There was soon a reaction to the fact that Kazaa's owners were secretly embedding spyware into the program, such as private third party software and banner advertisements without informing the user (Rojas 2002). In 2002 a hacked version, called Kazaa Lite, came on-line, from an anonymous source, 'a Russian programmer known only as Yuri' who reportedly wanted to stop 'misleading' people, arguing that open networks allow file sharing to grow by providing access, but that many users would avoid Kazaa with bundled spyware, but that 'Kazaa Lite' would encourage the network to grow. This was borne out by the popularity of the new software, with 80,000 downloads in 3 weeks when site went live. However, in mimicry of the recorded music industry, the Australian owners of Kazaa vowed to defend their legal rights by taking the new version offline (Rojas 2002). Development of file sharing software is undoubtedly a major part of the

story but the situation has been made more complex by the development of technologies to play back MP3 files over a range of devices. These include hardware, portable players, free software to allow downloaded music files to play on personal computers. It is the heterogeneous nature of these changes that has turned file sharing into a new way in which to access music.

Related technologies

Portable MP3 players, which enabled music downloaded from the internet to be transferred to an independent device soon appeared in a variety of formats while manufacturers struggled to optimize cost, weight and memory size (Irvine 2002a, Lock 2001). Such problems have apparently been resolved with the launch of the instantly popular MP3 player iPod by Apple in 2002, which is able to store more than 1000 songs, and has been widely praised as sleek, easy to use with good sound quality (Irvine 2002b).

Other developments also had an impact on the problem. Software developments in Streaming enabled the advent of continuous music played on the computer from small, niche radio stations ('Stream Team' 2001). Also the diffusion of self help and software reviews in popular magazines promoted use of p2p programs and made it impossible for any business organisation to suppress the information (Allen 2001a, Irish 2001, Sweeny 2001). Compact disc players that play MP3 are available for cars, while others offer free software for playing MP3 files on PCs, and a future for playing MP3 on mobiles was reported due to innovations from both Sony and Nokia (Allen 2001b, Shaw 2002a). So a home computer can now become 'a sound system to rival your home stereo' (Shaw 2002b).

Industry responds defensively

True to Schumpeter's thesis, the initial response from the incumbent firms was to ignore the development of the new technology until the music exchange activity started by Napster fuelled a combined, reactive response. Such deep-rooted failure to comprehend the nature of the innovation, to continue to believe that it could be controlled firstly through the weight of the law, then through the power of copy protect technology,

reveals a collective reluctance to respond, as Utterback (1994) suggests, through corporate renewal and entrepreneurship.

Legal action

The aggressive legal onslaught unleashed by the majors through the RIAA on Napster continued, targeting p2p providers, which were based in the USA, however, it soon became apparent that the beast had changed its spots, and that unlike Napster, the dispersed nature of the technology made it impossible to control in this manner (Spar 2001). Timms (2003a), for example reported that the industry was reduced to using strategies to counteract digital music file sharing such as legal warnings, and lobbying against illegal music downloading. The large firms decided there was no choice but to highlight the criminality of the users, so the RIAA announced 250 lawsuits filed against users of file sharing copyrighted music changing focus from the file sharing sites to individuals who use them (Sweeney 2002).

Similar threats soon followed in Europe, from an industry now under threat from the spread of broadband (Milmo 2004). The EFF however, remained unimpressed, pursuing a campaign to make p2p software legal, claiming that the music industry has always reacted in this entrenched manner to technological change (www.eff.org). Birch and Davidson (2003) pointed out that litigation is a costly option and the industry would find it difficult to succeed. They estimate \$50million had been committed to anti-online piracy litigation, aiming to set legal precedence and drain money from venture capital for file sharing developments, as the 'entry barriers to setting up file sharing services are very low and there are programmers whose anti-establishment ethics drive them to build these 'free for all' services' (Birch and Davidson 2003, 6).

Copy protect technology

In addition to legal vigilance, defensive innovation has been used to control access to music files by adding encryption (known as copy protect technology) to stop CDs playing on home computers. The Campaign for Digital Rights acknowledged the introduction of copy controlled CDs was an attempt to reduce the amount of MP3 file sharing as well as

the widespread practice of CD counterfeiting for profit. However, the campaign is concerned with retaining a balance between the powerful corporations and individual freedoms, so that, as Keegan (2002) stated, 'encryption software protected by the EU CD, allows the music industry to write its own rules as to how copyright material may be accessed and distributed. Effectively the market and not the public is being allowed to define what's fair use and what is not.' The technologies, such as Key2Audio and Cactus Data Shield were explicitly designed to stop new CDs being used for file sharing although something of a backlash was anticipated as 'more and more people are using their personal computer as a hi-fi and their laptop as a personal CD player' (Craig 2002). Birch and Davison (2003) also noted the advent of 'copyright policing' - software techniques to track availability of copyright infringing material on the web, which allows legal 'take down' notices to be served. This is another means by which to slow the spread of new music on p2p networks (Birch and Davison 2003)

New Business Models

World wide sales of recorded music continued to fall in the first half of 2003 (Milmo, 2004). Birch and Davidson (2003) reported that, in 2001, 8 billion tracks were exchanged using file sharing software, fuelling a debate on the actual financial loss to the industry. The bulk of music downloads appeared to be from the current music catalogue, while new users of p2p software tended to search for the music back catalogue. The authors' also pointed out limits to the rhetoric of sharing as 20-25% users seemed to refuse to share files (15-20% disable the sharing functionality of p2p services and 5-10% put files into a secure area of hard drive, possibly to escape detection from the industry). Just before and after release of a new music single, digital copying had been shown to be compressed mainly to a 3 week period of maximum popularity. However, inquiries showed an industry divided on assessment of the impact of file sharing, 65% appeared to think there was either no impact on sales or that the exposure had a positive or negligible effect of loss of up to 5%. A sizable minority, 35%, rated the loss to the industry as over 5%. In effect the authors suggested that around 5% had been lost in sales in the USA, due to file sharing, while the picture was not so clear in Europe. They pointed out that the

USA had the widest diffusion of broadband facilities and a high growth rate of a sharing community (Birch and Davidson 2003).

The issue was raised regarding consumer expectations in the era of digital music. Howard Stringer, Chairman and CEO of Sony Corporation of America was reported as saying; 'in the music business the problem is easy to see. We alienated music people; we alienated the consumer when we cranked up CD prices too high, and we alienated the retailers for the same reason. There was dissatisfaction at the number of tracks on a CD that were any good. We upset the artists because they felt they were being ripped off, and device manufacturers' were confused about it all' (see Timms 2003b). A perceived lack of commercially viable legal business models was identified as internet music seemed hard to buy but easy to share (Teather 2003). Birch and Davidson (2003) felt that policing and encryption were not long-term solutions, but the industry needed to develop new strategic approaches. The success of the digital music pay service by Apple, iTunes in the USA in 2001, added some urgency to the need for legal sites offering a higher quality product (Barkham, 2004). However, Swartz and Markoff (2004) observed this required a significant investment in the necessary software development, raising cost and risk, in the face of low volumes of sales. Birch and Davidson (2003) agreed that subscription services have long uncertain road to consumer acceptance, but they also estimated that \$600million had been collectively committed to bringing good services online. The authors were not wholly optimistic about the potential for the incumbent players to make a success of new ventures, envisaging problems with industry co-operation necessary to provide a good back catalogue, and the need to harmonize rather than compete with different technologies. In addition, they pointed out, artists would not necessarily want to give music labels right to digitize their work without agreement for royalty payments (Birch and Davidson 2003).

Finally, the user-led nature of these developments was acknowledged, consumers were seen as having certain demands, as they 'want to browse music and sample before they buy. Clunky technology and excessively high pricing models are not tolerated' and 'the nearest alternative is not only straightforward to use but free' (Birch and Davison 2003,

6). Essentially, it had to be accepted that the advent of p2p software had a commercial effect by bringing down the price that people are willing to pay for digital music tracks.

Discussion

The web has introduced a new form of competition for music distribution, based on the value-to-users of music sharing rather than the value-to-corporations of profit maximization. File sharing has emerged as a contested site, where attempts for new software providers to profit from large amounts of sharing (such as through the 'bundled' adware incorporated into Kazaa) are met by 'cleaned up' versions of the software being released for free downloading. The business structure of Sharman Networks mirrors the organization of the decentralized p2p online network. In innovation terms these activities can be seen in a traditional light, as radical technological threats to the established business, which has forced the recorded music industry into a reactive position.

The distributed, global nature of the technology presents problems of control for the industry's point-of-view, where the nature of the product (short term, popular, global) demands control over key areas: technology; artistic creativity; consumers; and locality (see for example Negus 1992, Guilbault 2002). In addition, expansion of the internet threatens industry stability which is currently balanced on the activities of a few multinational corporations. The internet opens up much more freedom of choice in terms of distribution, and exposes the tensions that lie within the idea that popular music can be commodified in a particular way as a cultural product. However, the recorded uncertainties within the industry over the actual effect of sales from illegal file sharing (where a large proportion do not think it that significant as yet) mask the point that real concern lies in future trends, with the further diffusion of broadband to domestic users and potential for exponential increase in the p2p networks.

The rise of p2p file sharing, appears to vindicate those commentators who see the internet as a medium with public interest values incorporated into its fundamental technological architecture. However, what had become apparent is that there is no unitary concept of 'freedom' on the web, but, different meanings of freedom can co-exist. In the sense there

is the technical opportunity based on the 'open software' movement, to provide free to download software, as well as the freedom of users to download such programs. This has overlapped in the music file sharing case with a more established principle of 'fair use' of copyrighted recording, where consumers had the right to make a copy of their music, and with the common practice, established custom, even, of music sharing between friends. In the process of transferring this common right to the new medium of the internet, it changed the nature of the activity into concern over its strictly illegal nature.

Subsequently, the major firms would use the open nature of the file sharing networks, and the free information they provide to monitor the popularity of different tracks for their own market research. Conversely, the activities of Sharman networks in sending unauthorized data to the distributed user community in order to profit from their software may also be perceived as an exercise in (unwanted) internet freedom.

Also, it must be recognized that the exercise of the freedom to download music tracks is a technological one, in that it draws together a number of now compatible technologies that were not, initially, intended to be co-players in digital music provision. The wide diffusion of CD players that replay MP3 music files, and the development of CD 'burning' capabilities on domestic PCs, together with MP3 files, the development of portable MP3 players all contribute. Further developments such as internet radio, music collector sites, cheap e-retail CDs, MP3 vending sites could all be said to have hastened the process of institutionalization of music as an internet activity. Taken together these developments can be said to be forcing the process of creative destruction onto the established firms, allowing entrepreneurial activity to take root. It has exposed the limits to music as a product under the control of a global oligopoly. The new technology can offer everything the old technology offered and add benefits for the consumer/user, as the advantage of small MP3 players over the larger and heavier CD versions.

Is the creative destruction of a global oligopoly possible? Innovation theory indicates the way through is for corporate entrepreneurs to take on the challenge and for senior managers to create an organizational climate favourable to the risky nature of radical innovation. But in the music industry appears to have a tradition of retrenchment and

defensiveness against (what had actually been the ever present) threat of creative destruction. Creative destruction threatens now because consumer/users have a choice due to the rapid rise in popularity of MP3 files and the rapid uptake of file sharing software. The software could be said to have a good 'fit' into the existing structure of modes of consumption, dependence on high volume global sales of a relatively few, highly managed single tracks and the pressure for their rapid obsolescence. It should also be noted that popular music pre-dates the oligopolistic organisation of the recording industry, and exists in musical traditions that are much wider than Western popular genres. Furthermore, music can also be experienced as a public, shared activity, as well as a private, consumer good.

Consumer/users on the internet are acting also as searchers, distributors, sharers of subcultures and identities, looking for new experiences (Negus and Pickering, 2002, Hesmondhalgh, 2002). The transitory nature of manufactured pop, short attention span, short lifetime, disposability gives it an affinity with the easy disposability of computer files. The digital world and popular music seem to have a mutual interdependence that was not intended or planned for, and which can be seen as part of the unintended effects of radical technological innovation. Music available on the internet has developed a public, or shared ethic, that mimics the reported 'public service' ethic more easily than a commercial one. Software developers of freeware have provided the means to share music and replay it, and the ease of p2p communication has facilitated the means of communication and free exchange. In many ways this has illustrated the on-going applicability of Schumpeter's theory of creative destruction through discontinuous technological change, and demonstrates the radical technology of the internet that can threaten such a powerful global oligopoly.

Conclusion

The case of music distribution over the web provides case study in adoption of the radical new techno-economic paradigm that the diffusion of ICT is taken to represent. This case highlights the impact of these technologies, not just as means to transform business processes, but also as fundamentally challenging to entrenched business practices. New

approaches posed by e-commerce to traditional business transaction, such as the changing role of the user, and re-evaluation of the value of digital information are central issues for the music sector. The ease with which millions of web users exchange digital music files, as well as the resistance and lack of vision displayed by the major firms, is a typical example of the pattern of change. In contrast to the long time lag proposed by Freeman and Perez (1988) for changes to become established, the case of the music sector exposes speed of uptake by the users as the factor which threatens to destabilize the business and has forced it to take account of technological change.

It would be wrong, however, to consider the impact of new forms of web use on the music industry as a typical example of the new structure brought in by the wide diffusion of information technology. This article has attempted to locate more recent technological change within the 'historical precedent' which Scarborough and Lannon (1994) had identified at the organisational level, in which there is an entrenched response to the process of uptake and adoption of new technologies. In this case, it can then be understood that the particular reaction to technological change has an established history, that in general large, established firms this sector will react defensively rather than offensively to new technologies. This is true in particular, to discontinuous innovations, which pose a challenge to revenues generated through the exploitation of copyright. It can be said that there has been no sense of collective learning in this sector to the knowledge that the threat posed by radical technologies does not emerge over the long term, even when users have adopted new methods of music playback. In fact, experience demonstrates that many new opportunities for music sales emerge quite quickly with the adoption of new technologies.

Thus, the music sector is a significant business to study, when investigating how the cultural industries react to the use of radical new technologies. An initial analysis seems to indicate that the opportunities are quickly exploited by new musical genres that were previously marginalized by the large incumbents. This appears to have been the case with the diffusion of radio, and could also emerge from the availability of a wide range of

music on the p2p network. It is also a reflection of the observation by Jones (1992) that innovation in popular music is intricately linked with the process of technological change. Thus, the use of ICT is affecting both music production and consumption, as well as legitimate sales and piracy, will turn out to be the greatest transformation new technology has yet posed to the music business.

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