The Software Slump:

digital music, the democratisation of technology and the decline of the recording studio sector within the musical economy

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Introduction

The role that software plays with within the economy is now widely acknowledged (Wise 1998; Lessig 1999; Thrift and French 2002; Dodge and Kitchin 2004; 2005; 2005; 2007). Software is recognized as a significant economic agent in at least three ways. First, the production of software constitutes an important industry in its own right. There is no clearer signal of this than the fact that Microsoft is one of the world's largest companies, and that the software industry is a significant generator of income and profits the world over (Hozic 1999; Auletta 2000). Indeed, the industry is so large that it is able to remain highly profitable despite a chronic problem of copyright infringement in many countries of the world, while it also able to support the business model of Open Source which is based on the giving away and sharing of code between programmers and users (von Krogh, Spaeth et al. 2003; Zeitlyn 2003; Weber 2004). Second, the significance of software can be determined, ironically, by its taken from granted nature. Software and code has sunk into the business background (Leyshon, French et al. 2005), and much of the economy would simply be unable to run without it, and all manner of procedures, conventions and protocols are highly dependent on the unproblematic unfolding of software programs (Thrift and French 2002; Dodge and Kitchin 2005). Moreover, within some industries software has been part of the business vernacular for decades, since at least the 1960s in some cases. Third, and finally, software is seen as a catalyst for economic change. This view of software and code became particularly prevalent in the 1990s as part of the hyperbole that surrounded the unfolding of New Economy. As the dot-com bubble burst in 2000, many were the equally quick to dismiss the significance of this software-fuelled era of rapid boom and bust (Henwood 2003). However, while it is important to guard against the danger of technological determinism in explaining economic change, recent critical reflections on the New Economy have concluded that its legacies have been significant and enduring with important geographical consequences (Leyshon, Bradshaw et al. 2007; Martin 2007; Pratt 2007; Zook 2007).

2. Copyright capitalism in an era of digital reproduction

Since at least the 1990s a number of industrial sectors have been caught up in a crisis afflicting copyright capitalism in an era of digital reproduction (Lessig 1999; 2001). Industries that produce commodities that rely on copyright legislation for their efficient commercial exploitation but that can also be rendered in digital form have been subject to significant processes of restructuring over the past decade or so. They include the motion picture, photographic, publishing and software industries (Pratt 2001; Vaidhyanathan 2001; Currah 2003; Gluckler 2005; Currah 2006; 2007). However, it has been within the music industry that this digitally-induced crisis of reproduction first came to prominence and arguably has developed most fully (Leyshon, Webb et al. 2005). The scale of the problem facing the music industry by the middle of the first decade of the 21st century can be gauged by comparing legitimate and illegitimate download service. Developed by Apple computers to provide a legal download site that would ensue that customers generated revenues for music that would flow through the music industry value chain, iTunes has undoubtedly been a very successful innovation. In 2005 the site recorded its billionth download, and the revenues from downloads reached more than $1b billion per annum in that year. The service had a library of over two million songs available, which was heavily trawled producing 420 million downloads in 2005 alone. The downloads from the site are subject to digital rights management, which limits the number of machines to which they can be copied and ensures that the files do not circulate endlessly and without limit across the Internet. The download platform has also been successful for Apple in other ways too; it is supported by its highly successful range of MP3 players – iPods – which may have even have promoted legal downloads as the files downloaded from iTunes are only playable on machines with Apple software.[1] Moreover, Apple are not the only company offering downloads that ensure that revenue flows from consumers to record companies, publishing companies and artists; there are now over 300 legal online sources of music available on the Internet.

However, the scale of the problem facing the industry is that these all these service are dwarfed in scale and scope by systems that make it possible to download illegal or 'pirated' material. As long ago as 2003 the top 10 peer-to-peer (P2P) download programmes – systems that facilitate the illegal downloading of music – had themselves

[1] Although it has been argued by some, including the European Union, that this lock-in is motivated more by Apple's attempt to reduce competition with its own service rather than an inherent concern for music copyright. Moreover, the machines will happily play MP3s obtained form illegal download sites.

the tracks. Over 60 per cent of consumers chose to pay nothing at all, apart from the obligatory 45 pence administration fee (Comscore 2007).

The correlation between the rise of material available to be downloaded freely on P2P download sites, and the sharp fall in the volume of global music sales – a decline of at least 15% between 2001 and 2004 – unsurprisingly led many within the music industry to argue that the former was the cause of the latter. While it would be naive to suggest that the amount of material available online has had no implications for retail sales, research commissioned by the music industry itself would suggest that the relationship is a little more complex and ambiguous than many in the industry insiders believe. For example, research sponsored by the British Phonographic Institute (BPI) on illegal downloading in the UK in 2004 produced two main findings: first, that the number of illegal downloads was stable, and not increasing, but which was attributed by the BPI to their enthusiastic policy of issuing threats of legal action to offenders, forcing them to desist from either uploading or downloading, and; second, that there had been an increase in the number of full album downloads, which was seen to be a product of the ongoing roll out broadband Internet provision in the UK. This was encouraging the volume of illegal downloading, the report argued, because 50 per cent of illegal downloaders obtained more than four tracks per month, compared to only 38% of illegal downloaders. The report also estimated the monetary cost to the industry of illegal downloading, which was calculated to be £278 million in 2003 and £376 million in 2004. However, it should be pointed out that these figures were likely to be significant overestimates, given that the research assumed that each download was a direct substitute for a purchase. This is, of course, a highly unrealistic assumption; free and paid for downloads are clearly not equivalents. Indeed, when one analyses longer run data on the real value of UK recorded music sales then the picture is more ambiguous. The value of UK recorded music sales actually increased in real terms between 1978 and 2004 (see Table 1). Sales also increased between 1994 and 2004, the period during which Internet piracy became a recognizable phenomenon. Moreover, data on UK-based record companies' net invisible earnings between 1993 and 1998 reveal that this form of income peaked in the 1995 before declining thereafter, several years before the MP3 gift economy had broken out of the tightly defined groups of hackers and programmers to which it was formerly confined (Table 2). Therefore, Internet piracy is better seen as a 'tipping point' in the development of the music industry which was already struggling and on the verge of crisis (Leyshon, Webb et al. 2005). The recovery rate within the industry

particular places which, once established, become 'magnets for talented individuals from other places, who migrate to the centres in search of professional fulfilment' (Scott 2000). As Scott has illustrated, based on analysis of commercial success of record companies, the recorded music industry in the United States is largely based in the agglomerations of New York and Los Angeles, with cities such as Chicago and San Francisco and Nashville existing very much a secondary centres. The only city that challenges either New York or Los Angeles as a centre for the Anglo-American recorded music industry is London (which does not figure in Scott's work, which is limited to the United States). London has been an important centre for the music industry since at least the 1960s, when the major US and European record labels increased their capacity in the city as British popular music become internationally significant in the wake of the success of the Beatles and the 'British invasion' of US popular culture. London is now the headquarters of one of the large 'big four' music conglomerates – EMI – and has traditionally been an incubator site for smaller and independent record labels.

The urban focus of the recorded music industry can be explained to a large extent by the concept of the musical network (Figure 1). Leyshon (2001) argues that there are four main types of musical network: creativity, reproduction, distribution and consumption. Each of these plays a distinct role in the value chain of the musical economy, and also have their own distinctive geographies. Networks of creativity, which involves practices such as composition, performance and recording – what Scott (2000) describes as the 'creative field' – is the network within which music is at its most unstable and volatile. As a result, this network involves the participation of large numbers of actors with different skills and competencies from an array of different institutions. These actors and institutions tend towards agglomeration in attempt to cope with spillovers, which are endemic where knowledge is volatile and in process (Scott 2001; Bassett, Griffiths et al. 2002; Pinch, Henry et al. 2003; Bathelt, Malmberg et al. 2004; Coe and Johns 2004; Scott 2004). To date, academic research on the functions that make up networks of creativity have mainly focused on the role of record companies (Negus 1999; Negus 1999), while those studies that have been concerned to determine the impacts of the current crisis on the musical economy have also tended to take the record company as their default institutional focus (Leyshon, Webb et al. 2005).

This paper makes a start at rectifying this imbalance by focusing on the role of recording studios within networks of musical creativity, and analyses the impact of the ongoing crisis of the music economy upon them. It draws upon research undertaken by

employment, plus the gross trading profits of companies and value of rent received – to be about the £50m per annum. In addition to this, the report estimates that there were around 350 full-time producers which, combined, were responsible for generating £20m of value added to the economy. This report was a development and an extension of an earlier report undertaken for the National Music Council by Dane et al. (1999) which provided a more detailed analysis of what might be described as the value chain of the musical economy. An analysis of value added per employee reveals that the average figure across the industry is £29,000. The highest contributions to value added per capita are made by composers, publishing companies and record companies, whereas both recording studios and record producers fall well below this industry average at £22,000 and £18,000 value added per employee respectively (see Table 3). What this analysis reveals is that the recording studio sector is not a particularly profitable or efficient part of the musical economy overall, particularly compared to record companies and publishing companies, not withstanding the deepening of the crisis of the music industry described above. It is, or at least has been, a crucial part of the overall value chain of the musical economy, producing commodities upon which large parts of the industry depend.

So, how are we to understand the role played by recording studios within the broader musical economy? One way to do this is to outline the assets that they possess that enable them to generate business within the music industry. If one does this then studios may be seen as socio-technical spaces that use in combination the following assets: space; time; technology; expertise, and; 'emotional labour'. We will now deal briefly with each of these assets in turn. First, recording studios provided dedicated *spaces* for the recording of music, which vary from large orchestral rooms to smaller and more intimate spaces, but all of them have distinctive acoustic properties which have either been created by their original design or through subsequent iterative acts of tinkering, that make them suitable spaces for the performing and recording of music (Cunningham 1998; Cogan and Clark 2003; Simons 2004). Second, studios sell *time* in these spaces, and are the sites for project based work (Ó Riain 2000; Grabher 2001; Christopherson 2002; Grabher 2002; Grabher 2002; Grabher 2002; Hertel, Niedner et al. 2003; O'Mahony 2003; von Krogh, Spaeth et al. 2003). This mode of work is common across the creative industries more generally (Jones 1996; DeFillippi and Arthur 1998), and recording studio projects can last from just a few days to many months. Third, studios provide dedicated *technology* that facilitates the recording of music, and to that end are the sites of

The recording studio market and business models

The assets outlined above are deployed by recording studios in a market that is characterised by oligopsony; that is, a market characterised by few buyers. The demand for the services of recording studios is driven by a relatively small coterie of record, motion picture and television companies which, for the most part, provide the investment that enable artists to use professional studios. As is typical of oligopsonies, the concentrated power of buyers has encouraged intensive competition among suppliers which has brought about a significant deflation of studio fees.[5] It was widely reported during interviews that the rates for renting studio time in 2005-06 were the same as in the mid-1980s which, if one takes into account the economy wide inflation of wages and prices over that time, represent a significant deflation of the fees that studios are able to charge. All studios have a set of posted 'day rates' for the hire of their different studios, but it was admitted that it was very rare to be able to charge this as the representatives from the record companies in particular, and who constitute the heaviest demand for studio time, were well aware of the level of competition between studios for business and would expect a discount on the published rate. The Association of Professional Recording Studios (APRS) has sought to resist the tendency towards rate discounting, and encouraged studios to hold the line of fees, arguing for a transparent market whereby studios compete on their posted day rates. However, as a number of studio managers admitted in interviews, the tendency to cut a deal was difficult to resist in times of slack trading. Studio managers were all too aware that in a market of comparatively few buyers there were only so many clients one could turn away who refused to pay the going rate for services. The problem of fee deflation is further exacerbated by the progressive lowering of the barriers to entry in the market, as the cost of technology falls, and, at the margins, by the existence of so-called 'vanity projects', where wealthy individuals set up recording studios not so much as a coherent sustainable business but more as a glamorous venture which creates a space where it is possible to associate with (famous) musicians.

[5] There is a sizeable economic literature on oligopsonies, which are particularly prominent in agricultural and natural resources sectors, where the retail end of the supply chain is often characterised by oligopsony (see Lowry, S. T. and J. C. Winfrey (1974). "Kinked Cost Curve and Dual Resource Base under Oligopsony in Pulp and Paper Industry." *Land Economics* **50**(2): 185-192, Just, R. E. and W. S. Chern (1980). "Tomatoes, Technology, and Oligopsony." *Bell Journal of Economics* **11**(2): 584-602, Schroeter, J. and A. Azzam (1991). "Marketing Margins, Market Power, and Price Uncertainty." *American Journal of Agricultural Economics* **73**(4): 990-999, Sexton, R. J., I. Sheldon, et al. (2007). "Agricultural trade liberalization and economic development: the role of downstream market power." *Agricultural Economics* **36**(2): 253-270.)

respectively – and usually hired by record labels when they have a newly signed young band who they wish to isolate from urban temptations in order get music recorded.

The second type of market in which recording studios operate is the post-production market. This covers a range of work on already recorded work and includes mixing, scoring music to visual material, and the mastering of discs. The attraction of this work for studios is that the rates for studio space is higher for than for merely recording, and there is a high demand for space for such projects, although the duration of the projects is shorter. For example, the process of mixing, which involves finalising the balance of sound within recordings, usually takes about two days per track. For both mixing and music scoring, the fee covers the use of the technology and space only, as the producers and engineers are freelance. However, the third arm of the post-production market, mastering, is unusual, in that it is the last remnant of the traditional model of recording studio provision, in that the fees paid for mastering buys both an in-house engineer in a particular studio. Mastering is the final act of the creative process, where the mix of the tracks are stabilised onto a master disc which is then send off to networks of production where the now stabilised commodity is mass produced and distributed (see Figure 1). This is a highly specialised market, and the Anglo-American market is dominated by a handful of studios with a reputation for high quality mastering, such as Sterling Sound in New York, Gateway Studios in Portland, Maine, and Abbey Road studios in London.

The paper so far has placed the recording studio sector within the context of the musical economy as a whole, and outlined its market structures and some pressing imperatives. The next part of the paper sets the evolution of recording studios within a broader historical context, and charts their rise and fall in line with associated developments in the social organization of the musical economy and the development of technology and, in particular, software.

4. A socio-technical history of recording studios: an anatomy of decline

Since the development of Edison's first recording device in the late 19th century the musical economy has evolved in lockstep with technological innovation and development. Originally devised as a re-recordable dictation machine, the phonograph

> comfortable conditions. The warm air is continually washed and purified. Just over four and a half miles of electric cable connect the three studios with a central control room. Six microphones can be used at any one time in each studio and each microphone has separate control. This will ensure that all records will be recorded with the correct balance of instruments and vocalists. There are waiting and retiring rooms for artistes and special departments for the scientific maintenance of the whole installation. (Southall, 1982, page 19-20).

Thereafter other large record companies – companies such as Pye and Decca in the UK, Warners, RCA and Columbia in the US (Millard 2005), for example – began to build their own dedicated recording studios which combined musical creativity and technological development within dedicated spaces,. They became sites of innovation within which companies integrated activities all along the value chain of the musical economy. Thus, the equipment used in studios was often bespoke and only available within that company's studios. For EMI, this equipment was often developed in its manufacturing division located in Hayes, would be tested in the Abbey Road studios and not made available to competitor studios or companies. The laboratory-like status of studios of the early 20th century was extended to the dress code expected of its employees, who were expected to wear white coats at all times (See Figure 2), a practice which extended into the 1950s (Southall, 1982). Technology was carefully guarded, as was a set of tacit skills and competences developed by recording engineers, such as the placing of microphones in relation to the instruments being recorded, practices which, according to Horning (2004), 'were considered in large recording companies to be proprietary information' (page 709). Indeed, at least until the 1960s, studios were highly regimented and bureaucratised institutions, which in part reflected the role they played within the large vertically integrated organizations of which they were a part. Campaigns by musicians unions both in the United States and the UK against what was seen to be the threat to the livelihoods of performers from recorded music led to a series of accommodations between record companies and the labour that worked in their studios in the early 20th century (Coleman, 2003). The unionisation of both musicians and engineers within the studio environment that led to the imposition of a maximum of three separate three-hour recording sessions per day maximum – 10.00-13.00, 14.00 – 17.00 and 19.00 – 22.00 – and a clear demarcation of duties and responsibilities within both the studio and control room that Kealy (1979) describes as a regime of craft union regulation.. An outcome of this system was the development of clearly defined technical

studios were only available to artists signed to the record company that owned it. This contractual requirement locked artists into particular studios and guaranteed work for them. A particularly good illustration of this system in action is revealed from a vignette from the early recording career of Pink Floyd which is contained in the 1960s memoirs of promoter and producer Joe Boyd (Boyd 2006). Having negotiated money from a management agency to pay for a recording session in one of the fledgling independent studios in London which he produced, Boyd found that the band's manager used the resulting single – Arnold Layne – to negotiate a long recording contract with EMI. Despite his role in the initial success of the band, the deal meant the end of Boyd's role as the band's producer as EMI insisted that all future recordings would take place at Abbey Road under the control of one of their house producers.

But although this policy effectively meant that artists had producers and engineers imposed upon them, it created creative opportunities in other ways. Because studios were constructed in part as technical laboratories it meant that there was a very liberal attitude to the use of studio time by artists. As studios could only be used by artists signed to the record company, the studios were often not used to full capacity, and were certainly not seen as profit centres in their own right. Recounting the period in which he worked in Abbey road in the early to mid-1970s, one engineer observed that the large Studio 1 at the complex was often at a stand still and available for other activities as it was not booked to full capacity:

> … the number 1 studio is 90 feet by 40 odd or whatever, huge area, and if it wasn't busy we'd play badminton in there or there'd be someone maintaining a car … it was pretty laid back." (Interview 3, freelance engineer/former Abbey Road employee, Male 50s, 2005)

The loose and liberal organizational space of the studio came into its own for those artists that wanted time to experiment with new musical style and technologies, and it was during the 1960s that the studio became a compositional tool in its own right, rather than simply a space for making natural sounding recordings of music that could otherwise be performed live (Cunningham, 1998; Coleman, 2003).[7] In this respect, the studio system worked for the record companies, but it was an era that was already coming to an end.

[7] And Abbey Road was a particularly good illustration of this tendency, which was the studio at which both the Beatles and Pink Floyd, leading exponents in the use of the studio as a compositional tool, recorded much of their musical output.

regulation in the UK came in the late 1960s when George Martin, the producer employed by EMI to manage the recording sessions of The Beatles, quit his job and started up first an independent management company and then established a recording studio. Thereafter, there was a shift of successful producers and engineers to freelance status, and then in the 1970s a growth in the number of independent studios which provided the space for freelance producers to work beyond the studios of the record companies. Many of these studios were often set up by producers, and their business models were therefore based more on producers' royalty income than the efficient management of the studio assets themselves. In this regard, at least, independent studios were similar to the established record company studios.

The rather casual approach to use of studio assets came to an end in the late 1970s. For the traditional studios, it was often the result of the record companies of which they were a part being taken over by larger corporate bodies. For example, when EMI was taken over by electronics conglomerate Thorn in 1979 financial discipline was imposed on the Abbey Road studio, which subsequently run as a cost centre, which quickly saw the studio opened up to non-EMI artists and producers to maximise returns form the use of studio space. For the sector as a whole, it was the development of new digital recording consoles by UK technology companies such as Solid State Logic (SSL) and Neve, both established in the late 1960 and located in Oxford and Cambridge within what would later be identified as the British high fidelity cluster (May, Mason et al. 2001). These firms specialised in making recording consoles – the control desks at which engineers and producers work to craft recordings in studios. SSL and Neve were responsible for the development of so-called 'in-line' recording consoles, that gave engineers more control over the various sounds and components that were recorded in the studios, which each microphone and effect having its own set of faders and controls (see Figure 3). More importantly, from 1977 onwards SSL began to integrate computer software into recording consoles which significantly increased the ease and flexibility of recording sessions. In particular, it was the development of a recording console with 'Total Recall' that ensured their SL 4000 E desks transformed not only the practice of studio management but also the market for studio space, and Neve developed a similar system – the NECAM system – a year later. By integrating software and memory into the operating of desks, producers and engineers were able to easily re-establish the settings between recording sessions. Previously, detailed notation would have to be made of the position of faders and other instruments. This was not an insignificant task;

hiring rates based on the 'lock out'; that is, a day's booking would include the use of the studio for a 12-hour shift, including in this the hire of an in-house engineer and usually a tape-op. This not only led to an effective devaluation of the price of studio time but also a significant increase in the working hours endured by engineers. The move away from a profession characterised by a regime of craft union regulation was recognised as early as the 1970s by Kealy (1979, 1982) as the rise of less bureaucratic independent studios instilled more of service ethic in the studio sector wherein the client's needs were valorised above all others. The expectation that recording engineers will work extremely long hours in service of the client and the studio has latterly created problems of compliance with the European Working Time Directive which sets an upper limit of 48 hours per week, and has seen studio managers effectively coerce engineers into agreeing to opt out from the Directive's protection. One studio manager explained how he broached the subject with his in-house engineers:

> "… if you don't want to sign it's fine … it does mean that we probably wouldn't be able to put you on all the interesting sessions because we have to ensure that you're not going to over your 48 hours a week and if we think we've got a band that's going to go over 48 hours we'll not put you on that session. But feel free to sign it or not sign!" What can you say to them? "You're in a freelance business mate, if you want to get in with … the big clients you're going to have to work at their schedule". And it's not me that's dictating it, it's them! (Interview 16, Studio Manager, Male 50s, 2005).

The problem that confronts engineers is that although some are still employed as salaried employees, many are now classified as retained staff; that is, they get paid a small salary to be available for work for the studio, with their pay increasing when there is work to do, which is funded out of the fees paid by the client. Moreover, engineers are expected to progress to freelance status before they reach 30. To do so they have to build up a reputation and portfolio of work that will enable them to pursue a more entrepreneurial career in the not too distant future. As a result, they submit to an exhausting work regime:

> … it's … 24/7. You know, you feel guilty about asking for a Saturday off … in a months time … if you were to leave a studio and go freelance you could probably earn in four days what you earn in a month as a retainer … [12 hour shifts] minimum … you leave home at nine and you get home at midnight, one o'clock

discs to digital media, which effectively masked and compensated for the more competitive market in *de novo* recording. However, from the mid-1990s onwards, clear signs of a looming economic crisis began to emerge within the recording studio sector. This was manifested in at least four ways. First, a new generation of software applications served to disrupt the recording studio sector. The large recording consoles – still for the most part supplied by SSL and Neve – were increasingly supplanted by more overtly software-based digital recording systems. The rise of systems such as Pro Tools, which is essentially a PC-based recording console, has become the latest obligatory passage point for studios and has meant another round of significant investment. Although the recording rigs are considerable cheaper than the large recording consoles – at around only £30,000 per system they are about a tenth of the price of the standard desk –their initial cost conceals significant ongoing expenses in terms of software upgrade and new releases. The shift to digitally based recording has also removed one important income stream for studios which was the supply of tape for the recording process. Studios insisted on sourcing all their own tape and admitted placing considerable mark ups upon it in pricing studio time. However, direct recording to hard disk has made the use of tape superfluous. Moreover, the switch to digital recording has reduced the demand for space and time in the studio. The shift to software enabled recording has significantly reduced the cost of entry level equipment which has improved the quality and capacity of home recording. This has encouraged many artists to do considerable amounts of pre-studio preparation work, which signals a further fragmentation of project work to incorporate the space of the home or at least the home studio. In this regard, software and code has made possible a more regime of distributed musical creativity, which represents a democratisation of technology. Recording studios were highly privileged sites that allowed only those with sufficient resources to gain access to their facilities; now, with the growing ubiquity of digital recording media, and the possibilities of open access distribution sites such as MySpace and YouTube, all manner of artists that might have been prevented from finding an audience through the normal narrow channels of the music industry at least now have the opportunity to do so.

Second, there has been a steady decline in the size of recording budgets, which reduced the volume of money circulating within the sector:

> … it would be nice if you had … a budget of £100,000 to include some money for the producer in there. But we're making, you know, we're making albums for 20

5. Conclusions

This paper has explored the impact of the on going crisis of the musical economy on the recording studio sector. Technological change is intimately bound up with the history of the industry more broadly, but this paper has argued that software has had significant implications for recording studios over the past 30 years or so. Indeed, software has played a significant, albeit unforeseen, role in the crisis that currently besets the recording studio sector which is characterised by falling recording budgets, declining demand for studio space-time, deteriorating employment conditions, continuing erosion of barriers to entry, runaway production and, increasingly, studio closures. One of the major outcomes of the crisis has been an accelerated vertical disintegration of production. This process has been underway since at least the 1970s, as the number of independent studios and equipment suppliers increased, and most record companies have either sold or closed their own studios.[8] However, the current crisis has driven the process of vertical disintegration ever further. For example, record companies are now increasingly devolving the responsibility --- and cost – of delivering albums to management companies. Record companies have scaled back their involvement in the A&R activities that are responsible for discovering and developing new talent as they have increasingly become brand-led marketing companies. Management companies have responded to this growing reticence by emerging as significant intermediaries within the musical economy and are developing artists that they can pitch to record companies in the hope of securing long term recording – but also significantly – marketing deals. The implications of this vertical disintegration of production is serving to embed the musical economy further into established musical agglomerations, which in the UK means a strengthening of the music industry's ties to London and the wider South East region, which is now host to more institutionally diverse networks of creativity (albeit that some of these institutions have been thinned out).

The process of vertical disintegration can also be observed within studios themselves. In order to cope with the dilemma of selling studio-space time in a falling market, and to respond to the ability to use smaller studio spaces to record and mix tracks, several studios have created what are known as 'project rooms'. These are small, self-contained rooms which studios rent on an annual basis to producers. The rooms are

[8] The major exception here is EMI, which retains ownership of the iconic Abbey Road studios. Whether this connection will survive EMI's purchase by private equity group Terra Firma in 2007 remains to be seen.

References

Attali, J. (1984). *Noise: the political economy of music*. Minneapolis, University of Minnesota Press.

Auletta, K. (2000). *World War 3.0: Microsoft and its Enemies*. London, Profile Books.

Bassett, K., R. Griffiths, et al. (2002). "Cultural industries, cultural clusters and the city: the example of natural history film-making in Bristol." *Geoforum* **33**(2): 165-177.

Bathelt, H., A. Malmberg, et al. (2004). "Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation." *Progress in Human Geography* **28**(1): 31-56.

BBC_News. (2006). "Kazaa bcomes a legal service." Retrieved 9 December, 2007, from http://news.bbc.co.uk/go/pr/fr/-/1/hi/technology/5220406.stm, Published: 2006/07/27 11:51:39 GMT.

Boyd, J. (2006). *White Bicycles: making music in the 1960s*. London, Serpent's Tail.

Choi, D. Y. and A. Perez (2007). "Online piracy, innovation, and legitimate business models." *Technovation* **27**(4): 168-178.

Christopherson, S. (2002). "Project work in context: regulatory change and the new geography of media." *Environment and Planning A* **34**(11): 2003-2015.

Christopherson, S. and M. Storper (1986). "The City as Studio - the World as Back Lot - the Impact of Vertical Disintegration on the Location of the Motion-Picture Industry." *Environment and Planning D-Society & Space* **4**(3): 305-320.

Coe, N. and J. Johns (2004). Beyond production clusters: towards a critical political economy of networks in the film and television industries. *The Cultural Industries and the Production of Culture*. D. Power and A. J. Scott. London, Routledge**:** 188-204.

Coe, N. M. (2000). "On location: American capital and the local labour market in the Vancouver film industry." *International Journal of Urban and Regional Research* **24**(1): 79-94.

Coe, N. M. (2000). "The view from out West: embeddedness, inter-personal relations and the development of an indigenous film industry in Vancouver." *Geoforum* **31**(4): 391-407.

Coe, N. M. (2001). "A hybrid agglomeration? The development of a satellite- Marshallian industrial district in Vancouver's film industry." *Urban Studies* **38**(10): 1753-1775.

Cogan, J. and W. Clark (2003). *Temples of Sound: inside the great recording studios*. San Francisco, Chronicle Books.

Coleman, M. (2005). *Playback: from the victrola to MP3, 100 years of music, machines and money*. Cambridge, MA, DaCapo Press.

Comscore. (2007). "Press Release: For Radiohead Fans, Does "Free" + "Download" = "Freeload"?" Retrieved 11 November 2007, from http://www.comscore.com/blog/2007/11/radiohead_freeloaders_abound_b.html; published 5th November 2007.

Cunningham, M. (1998). *Good Vibrations: a history of record production*. London, Sanctuary.

Currah, A. (2003). "Digital effects in the spatial economy of film: towards a research agenda." *Area* **35**(1): 64-73.

Currah, A. (2006). "Hollywood versus the Internet: the media and entertainment industries in a digital and networked economy." *Journal of Economic Geography* **6**(4): 439-468.

Currah, A. (2007). "Managing creativity: the tensions between commodities and gifts in a digital networked environment." *Economy and Society* **36**(3): 467-494.

Dane, C., A. Feist, et al. (1999). A Sound Performance: the economic vale of music to the United Kingdom. London, National Music Council.

Kealy, E. R. (1979). "From craft to art: the case of sound mixers and popular music." *Sociology of Work and Occupations* **6**(1): 3-29.
Kealy, E. R. (1982). "Conventions and the Production of the Popular-Music Aesthetic." *Journal of Popular Culture* **16**(2): 100-115.
Leidner, R. (1993). *Fast Food, Fast Talk*. Berkeley, University of California Press.
Lessig, L. (1999). *Code and Other Laws of Cyberspace*. New York, Basic Books.
Lessig, L. (2001). *The Future of Ideas: the fate of the commons in a connected world*. New York, Random House.
Leyshon, A. (2001). "Time-space (and digital) compression: software formats, musical networks, and the reorganisation of the music industry." *Environment and Planning A* **32**(1): 49-77.
Leyshon, A. (2003). "Scary Monsters? Software formats, peer-to-peer networks, and the spectre of the gift." *Environment and Planning D: Society and Space* **21**(5): 533-558.
Leyshon, A., M. Bradshaw, et al. (2007). Geographies of the New Economy: an introduction. *Geographies of the New Economy: critical reflections*. P. Daniels, A. Leyshon, M. Bradshaw and J. Beaverstock. London, Routledge**:** 1-14.
Leyshon, A., S. French, et al. (2005). "Accounting for e-commerce: abstractions, virtualism and the cultural circuit of capital." *Economy and Society* **34**(3): 428-450.
Leyshon, A., P. Webb, et al. (2005). "On the reproduction of the musical economy after the Internet." *Media Culture & Society* **27**(2): 177-+.
Lowry, S. T. and J. C. Winfrey (1974). "Kinked Cost Curve and Dual Resource Base under Oligopsony in Pulp and Paper Industry." *Land Economics* **50**(2): 185-192.
Martin, R. (2007). Making sense of the New Economy? Realities, myths and geographies. *Geographies of the New Economy: critical reflections*. P. Daniels, A. Leyshon, M. Bradshaw and J. Beaverstock. London, Routledge**:** 15-48.
May, W., C. Mason, et al. (2001). "Explaining industrial agglomeration: the case of the British high-fidelity industry." *Geoforum* **32**(3): 363-376.
McCourt, T. and P. Burkart (2003). "When creators, corporations and consumers collide: Napster and the development of on-line music distribution." *Media Culture & Society* **25**: 333-350.
Millard, A. (2005). *America on Record: a history of recorded sound, Second Edition*. Cambridge, Cambridge University Press.
Moore, J. N. (1999). *Sound Revolutions: a biography of Fred Gaisberg, founding father of commercial sound recording* London, Sanctuary Publishing.
National_Music_Council (2002). Counting the Notes: The economic contribution of the UK music business. London, National Music Council**:** 71 pages.
Negus, K. (1999). "The music business and rap: Between the street and the executive suite." *Cultural Studies* **13**(3): 488-508.
Negus, K. (1999). *Music Genres and Corporate Cultures*. London, Routledge.
O'Mahony, S. (2003). "Guarding the commons: how community managed software projects protect their work." *Research Policy* **32**(7): 1179-1198.
Ó Riain, S. (2000). Net-working for a living: Irish software developers in the global workplace. *Global Ethnography: forces, connections, and imaginations in a postmodern world*. M. Burawoy, J. A. Blum, G. Shebaet al. Berekely, CA, University of California Press**:** 175-202.
Ouellet, J. F. (2007). "The purchase versus illegal download of music by consumers: The influence of consumer response towards the artist and music." *Canadian Journal of Administrative Sciences-Revue Canadienne Des Sciences De L Administration* **24**(2): 107-119.
Perlman, M. (2004). "Golden ears and meter readers: The contest for epistemic authority in audiophilia." *Social Studies of Science* **34**(5): 783-807.

Tables

Table 1: Real value of UK recorded music sales, 1978 (£m: 2004 constant prices)

Source: BPI, 2005

Year	£m
1978	934.2
1984	688.8
1994	1,188.4
2004	1,214.1

Table 2: UK-based record companies net invisible earnings, 1993-1998 (£m)

Source: Dane, et al, 1999

Year	£m
1993	233.0
1994	225.4
1995	317.7
1996	280.0
1997	262.5
1998	207.7

Figures

Figure 1: Musical networks. Source: Leyshon, 2001.

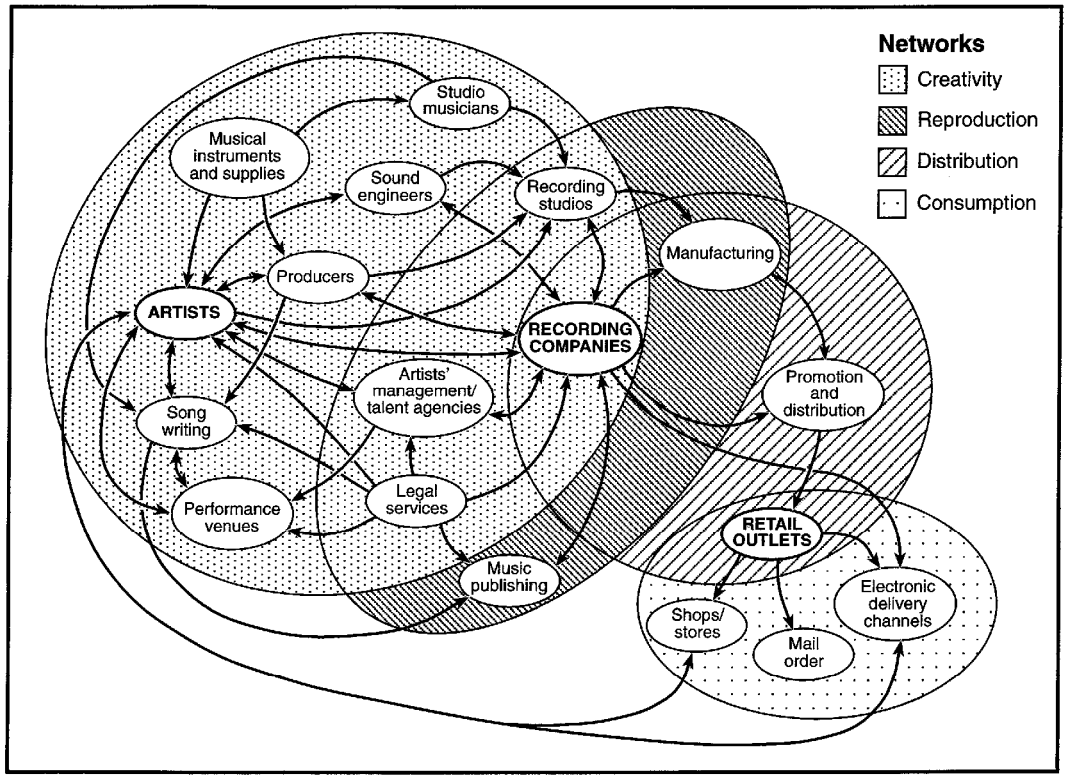

Figure 3: A late 1970s-early 1980s in-line Solid State Logic recording console. Source: SSL.