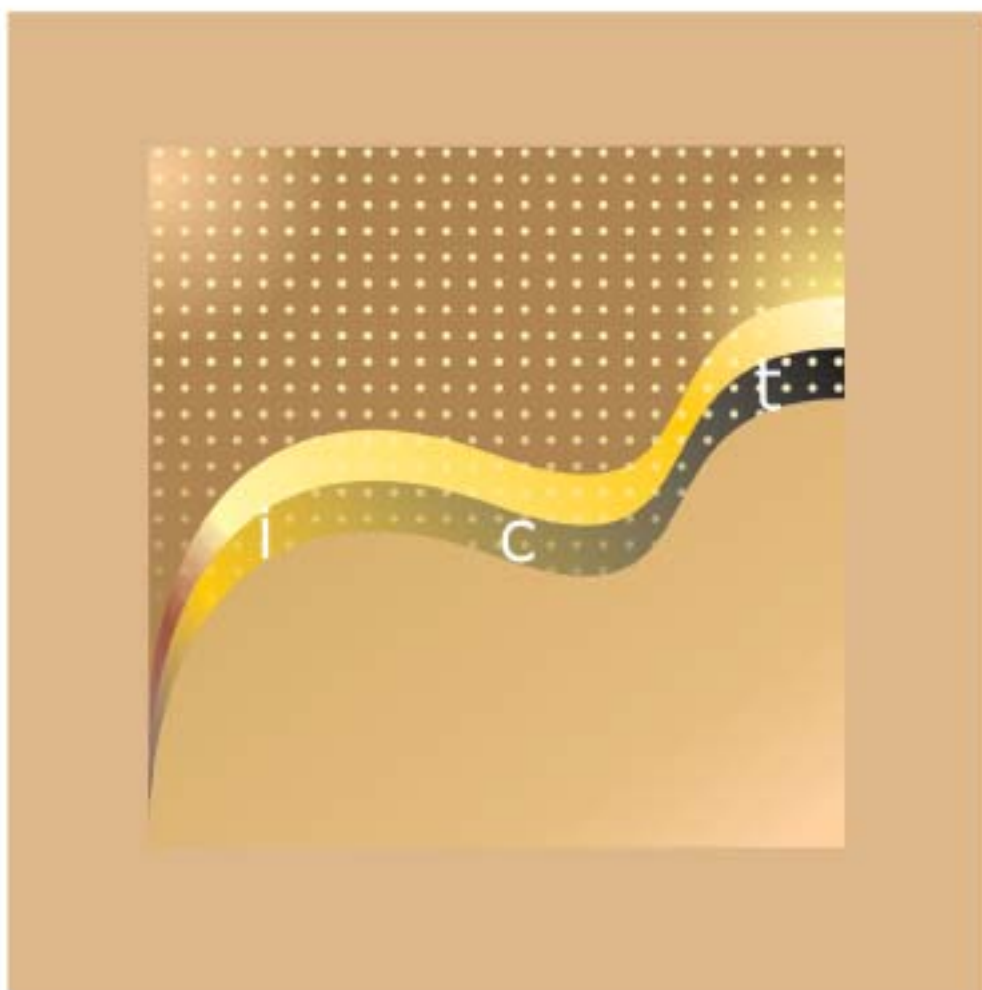


United Nations Conference on Trade and Development

# E-COMMERCE AND DEVELOPMENT REPORT 2004

## CHAPTER 3.



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## Chapter 3

# THE CREATIVE INDUSTRY AND DIGITAL AND INTERNET TECHNOLOGIES: THE CASE OF MUSIC

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Digital and Internet technologies and music are a near-perfect match. In the past, technologies were used to enable music to reach growing audiences and to assist artistic creativity. But it now seems that developments have outdone themselves. Like a young adult who has discovered his or her power of mind and body, music has run away from its guardians – the recording and publishing industries – and is cavorting with appreciative audiences on the Internet’s peer-to-peer networks. The music industry has recognized that these developments are foundational, and is adopting a dual approach for damage limitation until they play out with greater clarity. The first approach is to argue for an increase in the strength of copyright legislation and enforcement by Governments and international treaties. The second is to develop a commercially viable and legitimate alternative to the illegal but free downloading of copyrighted content. Despite some early success in several for-pay music download portals, the creative and business power of the Internet will be greatly advanced when artists, industry and audiences discover how to commercialize peer-to-peer (p2p) file sharing. Solutions were found for other problematic technologies: FM radio, cassette tapes and video tape recorders. Why, therefore, should it be different now?

The main problem is that the opportunities offered by technology require a change in the business model for artists and industry alike. Changing business models is in itself a risky business. But the music industry is no stranger to risk taking. Indeed, only 5 to 10 per cent of its releases achieve profitability. On the other hand, investors and stock markets have not been kind to the music industry since the Internet bubble burst in early 2000 and this may not promote boldness or visionary exploits.

From the artists’ perspective, digital and Internet technologies offer the possibility of greater independence and artistic control. The Internet can provide access to information on the commercial mechanics of the mainstream music business,

allowing artists to assess what revenue mix (recording, song writing, performing, etc.) and, accordingly, what investments will maximize their income for a specific degree of artistic and commercial freedom. More importantly, the capacities of modern digital recording and production technologies and the ability of the Internet to introduce artists to an audience, distribute their music and provide a conduit for a more personal relationship are ground-breaking. Therefore, policy efforts in developing countries should focus on providing maximum discovery of musicians and musical cultures using the Internet and digital technologies and avoid generating anxieties about losing out on possible, but actually improbable, stellar international recording royalty earnings. Modern and functional systems for copyright protection and royalty collection are needed in developing countries in order to develop strong national markets as well as to interact with the international entertainment industry. However, artists may have a preference for improved discovery over doubtful royalties and therefore should consider retaining control over their music and using all Internet technologies, including p2p file sharing and online distribution.

### A. Introduction

Information and communication technologies (ICTs) and Internet technologies are having a profound effect on the global production, distribution and consumption of music as well as other audiovisual entertainment. Stimulated by news of music piracy and file sharing, the debate and speculations about the outcome of this process have received a fair amount of attention in popular and professional media. What will become increasingly important is the fact that the Internet enables change in existing business models and music industry structures. Public reactions from mainstream media groups have often been defensive. At the

same time, however, all of them are working to find ways to embrace and profit from the technology.

The digitization of cultural industry products, the increase in the access to and bandwidth of broadband connections and the development of global p2p file-sharing technologies are transforming music recordings into public goods.<sup>1</sup> In turn, p2p technologies have fuelled the discussion about the role, purpose and practicability of copyrights and the related legal remedies. Thus the development of digital rights management (DRM) technologies has assumed a prime position for the mainstream entertainment industries, as the realisation grows stronger that they may not be able to depend on litigation, and the threat of litigation, to enforce presumed earnings.

Music, film and literature are labour-intensive and talent-based creations. By decreasing entry costs and fixed outlays, digital and Internet technologies will enable an economic democratization of culture and creative industries. Therein lies the potential for developing countries' creative workers and entertainment industry: using the Internet they could enlarge their market and increase their earnings. However, there have been debates about the effects of globalization on cultural diversity and the possible role of the Internet in this process. Being a disruptive technology, the Internet presents both threats and opportunities. Those who are aware of the issues and have a strategic and positive approach will possibly improve their fortune or, at least, fare better than the competition. Developing countries and their creative industries need to be in the forefront of developments. Any venture based on assumptions of a commercial and technological status quo will lead to sunk costs and lost investment.

This chapter will discuss developments, and draw conclusions and make recommendations that may be useful for cultural sector and music industry leaders in developing countries. It will describe how the relationship between ICTs and music developed and the potential that technology brings to the production and distribution processes. It should encourage creative persons and companies to review their business and technology strategies and models, and will highlight new commercial possibilities. In order to do this it will review and perhaps question the commercial and normative understanding of the music medium and its industry.

The chapter will begin with an outline of the global and regional music business, with illustrations from several developing countries. It will review the traditional business model in order to assess what is really at risk for artists, given the unstoppable invasion of Internet-based technologies. This will be followed by an overview of technological history and developments. The chapter will then examine why the Internet will change the music business, and will discuss a number of pioneering real-world examples that may initiate a broad process of re-engineering of existing business models. In general, the chapter will try to convey how technological progress, the nature of the Internet and the change in the economic parameters of the music industry are co-dependent issues. Finally, the chapter will discuss the issue of intellectual property and its arch-enemy—piracy—and review non-restrictive or public licences and open-source record companies as possible solutions and enablers of both content and technological development.

## B. The international music industry

The global entertainment and media industry is estimated to earn about 1 trillion dollars of revenue.<sup>2</sup> Of this, the music industry generates about 35 billion dollars. Five “majors” currently dominate the global market for recorded music: Universal Music Group; Sony; Warner Music Group; Bertelsmann Music Group; and EMI.<sup>3</sup> These companies are part of larger entertainment conglomerates that produce content, software and hardware for entertainment. Estimates vary, but most accounts put the majors' share of the global market for recorded music at between 75 and 80 per cent. Table 3.1 gives their annual sales figures for several recent years. However, size is not the same as profitability and indeed, as noted earlier, markets and investors have not been too enthusiastic about the stocks of the majors' parent companies. Chart 3.1 indicates that, with the exception of Bertelsmann, all have underperformed with regard to the Dow Jones market index.

The recording industry has had an international dimension since its beginnings. The two early recording companies – the Gramophone Co. and Victor – were both established by Emile Berliner,<sup>5</sup> the inventor of the flat disc phonogram, in 1898

**Table 3.1**  
**Annual sales of major recording industry companies**  
*(in millions of dollars)*

	2002	2001	2000
Sony Music	4 830	4 568	6 240
EMI Group Plc	3 487	3 785	3 799
Universal Music Group	6 276	5 811	6 224
Warner Music Group	4 205	4 036	4 148
BMG	2 700	1 446	4 548
<b>Total</b>	<b>21 498</b>	<b>19 646</b>	<b>24 959</b>

Source: Hoovers.com and UCTAD estimates.<sup>4</sup>

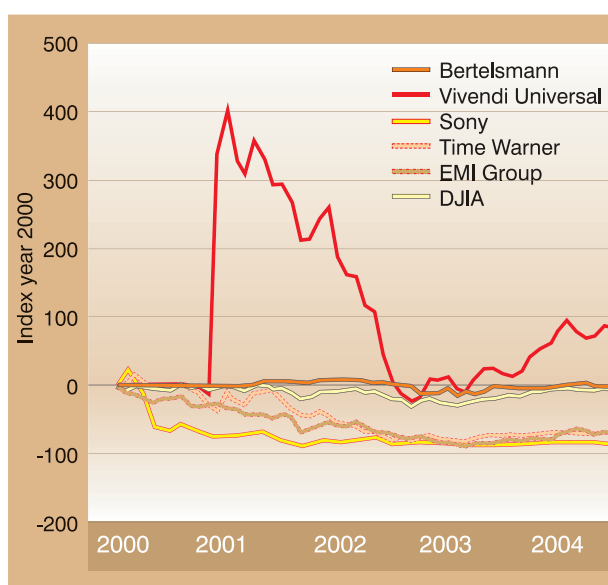
and 1901 respectively. Victor covered the Americas, while the Gramophone Co. covered the United Kingdom, continental Europe and the British commonwealth, thus segmenting the international market between them. The Gramophone Co. sent recording engineers across Europe to “capture” performances from which records could be made (Gronow and Saunio, 1998). International talent was sought out and globally appealing content was an important business proposition – for example, the signing and huge success of Enrico Caruso by Victor, the repertoire of which consisted mostly of opera sung in Italian. The first Indian recording by the Gramophone Co. was made 1902. Among the most successful Indian artists was Gauhar Jan of Calcutta, a popular singer

of the Thumri genre – a light classical style popular in Northern India.<sup>6</sup>

The Odeon label of International Talking Machine GmbH, Berlin, – established in 1904 and together with the French Pathé Records the main competition to Victor and the Gramophone Co. – pioneered similar explorations into the ethnic and local music of the developing world. By the end of its second year of business it claimed to have recorded over 10,000 titles in Arabic, Greek and Turkish. An important milestone was the signing of Salam Higazi, a very popular singer and often cited as the father of Egyptian stage music. What set Odeon apart was its business model. Odeon did not establish branches overseas. Instead, it

**Chart 3.1**

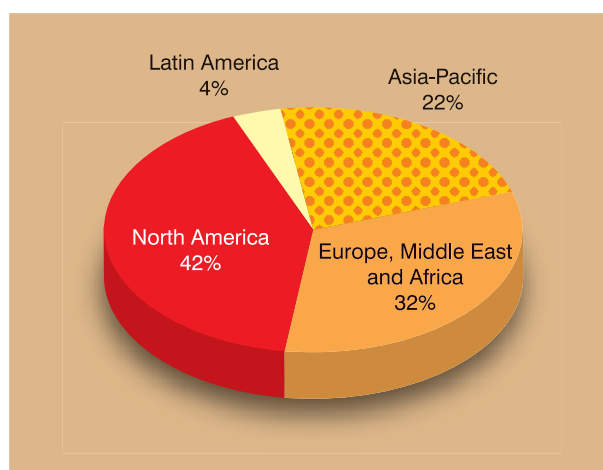
**Stocks prices of the “majors”, 2000-2004**



Source: Yahoo.com.

**Chart 3.2**

**Market for recorded music (2002, in millions of dollars, by region)**



Source: Pricewaterhousecoopers (2002).

**Table 3.2**  
**Music CD and music cassette (MC) sales volumes**  
*(in millions of units\*)*

	CD 2003	CD 2002	MC 2003	CD+MC 2003		CD 2003	CD 2002	MC 2003	CD+MC 2003
					<i>continued</i>				
1. United States	746	803	17	763	32. Denmark	10	12	0	10
2. United Kingdom	234	222	1	235	33. Finland	10	10	0	10
3. Japan	206	229	4	210	34. Saudi Arabia	0	0	7	7
4. Germany	147	179	16	163	35. Colombia	7	8	0	7
5. India	15	9	138	153	36. New Zealand	7	8	0	7
6. France	118	130	3	121	37. Greece	7	7	0	7
7. Russian Federation	30	18	85	115	38. Ireland	7	8	0	7
8. China	34	23	42	76	39. Chile	5	6	1	6
9. Brazil	58	80	0	58	40. Israel	6	4	0	6
10. Mexico	54	51	2	56	41. Malaysia	2	2	3	5
11. Spain	54	62	1	55	42. Philippines	3	3	2	5
12. Australia	53	49	0	53	43. Singapore	5	5	0	5
13. Canada	53	57	0	53	44. Hungary	3	3	2	5
14. Pakistan	2	1	36	38	45. United Arab Emirates	1	1	3	4
15. Indonesia	3	2	34	37	46. Czech Republic	3	3	1	4
16. Italy	36	37	1	37	47. Croatia	2	1	0	2
17. Turkey	11	5	25	36	48. Venezuela	1	2	0	1
18. Netherlands	25	28	0	25	49. Peru	1	0	0	1
19. Sweden	24	26	0	24	50. Ecuador	1	1	0	1
20. Thailand	9	10	14	23	51. Estonia	1	1	0	1
21. Republic of Korea	16	21	4	20	52. Iceland	1	1	0	1
22. Switzerland	18	21	1	19	53. Slovakia	1	1	0	1
23. South Africa	12	12	6	18	54. Slovenia	1	1	0	1
24. Ukraine	7	3	11	18	<b>Total</b>	<b>3126</b>	<b>2 252</b>	<b>4 66</b>	<b>2 602</b>
25. Belgium	16	18	0	16	<i>of which</i>				
26. Portugal	12	12	3	15	<b>Developed market economies</b>	<b>1830</b>	<b>1968</b>		<b>1882</b>
27. Austria	14	15	0	14	<i>in percentage</i>	87.5	87.4		72.3
28. Norway	13	15	0	13	<b>Developing countries and transition economy countries</b>	<b>306</b>	<b>284</b>		<b>720</b>
29. Poland	10	10	2	12	<i>in percentage</i>	14.3	12.6		27.7
30. Argentina	10	6	1	11					
31. Hong Kong	11	10	0	11					

\* Values of zero indicate that fewer than 500,000 units were reported. All values have been rounded of to the nearest million.  
Source: IFPI (2004).

appointed local agents whose task was to solicit artists, plan repertoire and then request technical recording services from Odeon in Berlin, which were consequently performed by a visiting engineer. The master recordings would be shipped back to Odeon in Berlin for finalization and reproduction. The records were then “re-exported” back to their indigenous markets (Vernon, 1997).

Despite its cosmopolitan beginnings, the overall performance of the music industry depends to a

large extent on the global marketing and success of Anglo-American popular music. Chart 3.2 shows the regional distribution of the recorded music market. With the exception of the odd hit (e.g. Valens’ *La Bamba*) or attempts at performing “foreign” material by mainstream artists (e.g. Martin singing *Volare* or Sinatra singing the Brazilian compositions of Carlos Jobim), it was only towards the end of the last century that the global music market showed signs of renewed geographical diversification. Already in 1980 one third of

**Table 3.3**  
**25 Largest markets by CD sales volume in 2003**  
*(in millions of units)*

1.	United States	746	16.	Switzerland	18
2.	United Kingdom	234	17.	Republic of Korea	16
3.	Japan	206	18.	Belgium	16
4.	Germany	147	19.	India	15
5.	France	118	20.	Austria	14
6.	Brazil	58	21.	Norway	13
7.	Mexico	54	22.	South Africa	12
8.	Spain	54	23.	Portugal	12
9.	Australia	53	24.	Turkey	11
10.	Canada	53	25.	Argentina	10
11.	China*	45			
12.	Italy	36		<b>Total</b>	<b>2020</b>
13.	Russian Federation	30		<i>of which</i>	
14.	Netherlands	25		<b>Developing and transition economy countries</b>	<b>251</b>
15.	Sweden	24		<i>in percentage</i>	<b>12.4</b>

\* Figures for China include those of Hong Kong (China).  
 Source: IFPI (2004).

Warner Music's revenues came from non-United States artists, increasing to more than half by the mid-1990s.<sup>7</sup> Similarly, EMI earns significant revenues from foreign artists and embraces a number of foreign labels, such as Electrola (Germany), Path Orient and ChinaCo (China), GramCo (India) and Colombia Nipponophone (Japan). In the same vein, Polygram — the former Philips/Siemens music business now part of the Universal Group — attributed half of its revenues to non-Anglo-American popular music production and had in the past set up factories in Egypt, Nigeria and Brazil.<sup>8</sup> Until the 1970s the music industry transnationals were largely based in the United States, with the exception of Philips/Polygram. The 1980s saw the entry of Japanese interests (Sony and Matsushita) and European corporations (Bertelsmann and Vivendi).

Tables 3.2 and 3.3 give figures for music CD and cassette sales in countries that have total reported sales above one million units. In terms of unit sales volume, developing countries and transition economies account for about 14 per cent of the global market for recorded music. When sales are measured in retail value expressed in dollars, developing countries represent only 6.7 per cent of global commerce. Adding the transition economies brings this up to 8 per cent. An important reason for the difference between the volume and value figures is the significant sales of low-cost

music cassette media in those countries, often surpassing CD sales in large multiples. Not all music is an internationally tradable item and creating local content may not require the sizeable investments typical of mainstream productions in developed markets. In 1999, two thirds of total music sales were not traded internationally, but produced and consumed locally. National sales of locally produced music range from 40 per cent in Europe to, unsurprisingly, since it is the world's largest producer and market, over 90 per cent in the United States. Latin America and Asia fall somewhere between these figures, while for Africa the figure is below one third. International Federation of Phonogram Industries (IFPI) data released in 2001 indicated that the share of recordings by local artists signed to local music labels rose from 58 to 68 per cent of sales between 1991 and 2000. The growth in local music spanned all regions, except Africa and the Middle East. The following country discussions will serve to better illustrate issues and concerns specific to the music industry in developing countries.

India has a music market worth \$144 million and is the largest developing country market in terms of unit volumes. It has been successful in establishing a close link between music and its enormous film industry: film music accounts for over 70 per cent of the total music market. The Indian Music Industry (IMI) organization has over 50 members,

including local branches of the majors. The distribution system for cassettes, and CDs and vinyl records remains anarchic and piracy is a major concern. The IMI claims that India is the world's largest pirate market in terms of unit volumes and sixth in terms of value. Music cassette sales outnumber CD sales eight times. A large export market created by Indians living abroad has begun to emerge and Indian producers need to explore the full range of possibilities for tapping this potential. This may be an important impetus for assessing the possibilities of digital technologies and e-commerce for music, and an obvious one when considering the apparent success of "offshore" portals such as the UK-based *Audiorec.co.uk*.

In 2003 Brazil was the ninth largest market for recorded music in terms of unit volumes, representing a retail value of \$309 million. It employs an estimated 8,000 people directly, and a further 55,000 indirectly in the retail trade, publishing and radio broadcasting. It has built a strong local repertoire that has grown to 79 per cent of sales in 2001, up from just under 60 per cent a decade earlier.<sup>9</sup> However, the five majors control most of the local market. Nonetheless, the *Som Livre* and *Music Abril* labels, owned by the large Brazilian cable television and broadband ISP *Net Serviços de Comunicação* and multimedia company *Grupo Abril* respectively, managed to enter the top ten best selling-music rankings in 2000 and 2001 with a combined four titles per year. Like India, Brazil has significant piracy problems and, according to IFPI, globally ranks as the third most pirated market, only behind China and the Russian Federation.<sup>10</sup> Given the size of the domestic market, the local music portal *iMusica*, discussed in greater detail in section G, has been offering for-pay downloads for several years.

South Africa is the largest African music market, generating combined CD and cassette media sales volumes of 18 millions units, valued at about \$160 million in retail sales. Sales of music cassettes represent one third. Unlike in Brazil or India, most sales come from international titles. In 2000, the Association of the South African Music Industry (RISA) categorized 62 per cent of all units sold as "international". This, however, represented a retail value of 77 per cent. RISA's membership consists of more than 50 businesses and includes the international majors. Piracy is an important problem and estimates place it at between 40 and 45 per cent of the market in units, or around \$65

million in value. While cassettes have been the biggest problem in the past, CD piracy has sharply caught up.<sup>11</sup>

In the Philippines there are 39 companies affiliated with the Philippine Association of Recording Companies (PARI) and several independents. Data collected from PARI show peak sales of 11.8 million units in 1997, declining to 5.6 million in 2003. Piracy is rampant and contraband media represents 25 to 50 per cent of the market. Popular music from the West had a 60 per cent market share in 1996, and much of the locally generated 35 per cent was music imitative of or derived from internationally successful repertoire.<sup>12</sup>

It is interesting to note that a number of historically significant national entertainment industries and musical "hot-spots" have all but disappeared from the global market. The five majors were all present in the Nigerian market that generated sales of 20 million units in 1993. However, a combination of political and economic instability, physical piracy, and the resulting departure of the majors by the mid-1990s, caused unit sales to drop to 8 million by 1996. Today, piracy is estimated to account for 85 per cent of total of sales. This moved the business to many smaller labels with more limited resources, making the enforcement of copyright and other contractual arrangements difficult, and thereby reducing possibilities for Nigerian artists wishing to enter the international market.<sup>13</sup> Another opportunity missed because of economic and political strife is the music of the Congo region. Congolese music, widely popular internationally, resulted from a mix of traditional music and Cuban styles, in particular rumbas, brought "back" on 78 rpm records produced by HMV. In 1955 the Congolese market was purchasing 600,000 records a year and this increased to 1 million by 1970. However, after several decades of economic downturn and civil war, many of its best musicians have emigrated and local purchasing power is inadequate to support a significant recording industry, in spite of a population of 55 million.<sup>14</sup>

Jamaica is another example of a successful musical milieu with an underdeveloped national market. In spite of the global success of its artists, whose international sales are worth anywhere between \$1 and \$2 billion, the local market managed to generate sales of only \$5.5 million and move barely 0.5 million CDs, music cassettes and vinyl

records in 2002.<sup>15</sup> Since the 1990s, several initiatives have been launched by Jamaican agencies and regional and international bodies, such as UNCTAD, WIPO and CARICOM, to support the growth of the music industry and in particular to strengthen the enforcement of copyright. However, such efforts have not succeeded in securing the involvement and trust of the musicians, performers, producers and record labels.<sup>16</sup> In 2003 the Recording Industry Association of Jamaica was founded, in what will hopefully be a more fruitful effort to grow the domestic market in line with the international success of its music.

### C. The business of music

Today, musicians have a choice between dealing with the traditional recording industry, and managing their own business in a way that would require profoundly embracing Internet technologies. In order to deal with this dilemma, it is useful to consider the mainstream options from a financial perspective. The following discussion owes much to Krasilovsky, Shemel and Gross (2003) and the numerical examples are provided in order to follow industry practice in the United States, it being the largest market and the one in which many musicians, including those from developing countries, hope to achieve success. It should be noted that more favourable contractual terms and greater paying rights, reflecting smaller overall sales volumes, may be offered to musicians in other developed countries.

For royalties to materialize, a composition is usually recorded and published: two separate and distinct activities. In practice, an artist may perform on a recording, may be the composer, or both. Two different contracts govern these activities: recording contracts and publishing contracts.

Recording artists' royalties are paid in return for recording music under a "work for hire" recording contract. Such contracts transfer the copyrights of the recording from the artists to the record company, in return for the payment of royalties. The record company will also pay a separate royalty to the composer in order to acquire the "mechanical right" to reproduce the composition.<sup>17</sup> On signing, a type of credit is provided to artists in the form of an advance that is recoverable from artists' royalties. The record company earns all income from the sales of the CD in excess

of royalties owed. Typically, no royalties are paid before the full advance is recovered. If the record does not sell and the advance recovery fails, the artists' debt will be rolled over to the next CD, as specified under the contract.

Recording royalties for newcomers are usually 9 to 13 per cent of the retail price of a full-length CD (Krasilovsky, Shemel and Gross, 2003; Rapaport, 2003; Hesmondhalgh, 2003, citing Caves, 2000). After a number of deductions and adjustments, artists' recording royalties are closer to 4 per cent or \$0.66 per CD sold. Box 3.1 and table 3.4 describe some elements of this process. Whether an artist can generate net royalty revenue may not be precisely related to the revenue of the record company. Given different assumptions and on the basis of the terms agreed in the contract outlining responsibilities and amounts to be spent in production and promotion, an artist may earn net royalties while the record company may not manage a profit on the artist. The opposite is also possible (case C), where the company earns a substantial sum, but the artist is left on the verge of debt, eventually "saved" by song-writing royalties but still left with many expenses to cover. It is also important to remember that a record company's profits on the overall talent portfolio may vary either because of poor sales or because of more mundane financial or management issues that can affect any business or industry. Earned income will need to cover management and administration costs, as well as losses from less successful releases.

The figures in table 3.4 indicate that under certain conditions artists may not have a financial interest in recording "expensive" projects. The notion of investing in high-quality production and promotion to ensure the success of a CD – case D – may be, however, more financially purposeful for the record company while mainly appealing to a sense of self-value, accomplishment or genuine interest of artists in working in a top-notch production environment. Thus, establishing realistic expectations about an artist's particular mix of revenue streams from recording, song writing or performing concerts can be a difficult exercise. Recording may not be a financially satisfying and secure strategy, in particular if the "artist" is a group or ensemble and monies are split many ways, especially if the CD will not turn "gold" in the United States.



**Table 3.4**  
**Theoretical cost breakdown of artists' and record companies' income: Four cases**  
*(in millions of dollars)*

	Case A		Case B		Case C		Case D	
	35% no-sale reserve		Full sale of distribution		Enhanced quality full sales		Going for gold 500,000 copies	
	%	\$	%	\$	%	\$	%	\$
1. Retail price of CD	100.00	16.00	100.00	16.00	100.00	16.00	100.00	16.00
2. Recording artist royalty	12.00	1.92	12.00	1.92	12.00	1.92	12.00	1.92
3. - Producer royalty	3.00	0.48	3.00	0.48	3.00	0.48	3.00	0.48
4. Net recording artist royalty	9.00	1.44	9.00	1.44	9.00	1.44	9.00	1.44
5. - Cost of packaging	17.50	0.25	17.50	0.25	17.50	0.25	17.50	0.25
6. Sub-total	7.43	1.19	7.43	1.19	7.43	1.19	7.43	1.19
7. - Deduction for free goods	15.00	0.18	15.00	0.18	15.00	0.18	15.00	0.18
8. Sub-total	6.31	1.01	6.31	1.01	6.31	1.01	6.31	1.01
9. - Reserve against returns	35.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00
10. Sub-total	4.10	0.66	6.31	1.01	6.31	1.01	6.31	1.01
11. Royalty income on 250,000 CDs	4.10	164 093	6.31	252 450	6.31	252 450	6.31	504 900
12. - Recovery of recording advance		100 000		100 000		250 000		350 000
13. Net recording royalty income before expenses		64 093		152 450		2 450		154 900
14. Net mechanical rights royalty for songwriting at 50% of \$0.60 per CD (paid through publisher)		48 750		75 000		75 000		150 000
15. Management fees (10% of advance)		10 000		10 000		25 000		50 000
16. Legal fees		10 000		10 000		10 000		20 000
17. Promotional activities (10% of 26+27)		15 000		15 000		30 000		60 000
18. <b>Total artist royalty income</b>		<b>77 843</b>		<b>192 450</b>		<b>12 450</b>		<b>174 900</b>
19. Wholesale price of CD (50% discount)		8		8		8		8
20. Record company distribution of 250,000 CDs		2 000 000		2 000 000		2 000 000		4 000 000
21. - Manufacturing and distribution at \$3 per CD		750 000		750 000		750 000		1 000 000
22. - Recording royalties payable less advance		64 093		152 450		2 450		154 900
23. - Mechanical rights royalties paid to publisher		97 500		97 500		97 500		300 000
24. - Free goods		300 000		300 000		300 000		600 000
25. - Reserve against returns (deduction in case A)		700 000		0		0		0
26. - Production of promotional video		100 000		100 000		200 000		400 000
27. - Promotional activities		50 000		50 000		100 000		200 000
Sub-total 21 through 27		2 061 593		1 449 950		1 449 950		3 154 900
28. <b>Total record company income</b>		<b>-61 593</b>		<b>550 050</b>		<b>550 050</b>		<b>1 345 100</b>
29. <b>Total publishing company income</b>		<b>48 750</b>		<b>48 750</b>		<b>48 750</b>		<b>150 000</b>
30. <b>Total music industry income</b>		<b>-12 843</b>		<b>598 800</b>		<b>598 800</b>		<b>1 495 100</b>

The theoretical sales figure of 250,000 should be put in perspective with national recording industry rankings. Table 3.5 presents an overview of rankings in several developed and developing country markets. It is clear that generating revenue from sales of technically high-quality recordings requires an international outreach. Perhaps only the United States' markets can absorb sufficient numbers of units and generate large enough revenue streams to motivate investment by artists and industry in recording for profit. Considering the limited

requirements of the Irish or South African ratings, or the fact that most Indian sales are of low-cost cassettes, we realize that international artists and music industries need to be rigorous in matching their production and marketing investments to the market. Given these risky economics, musicians, especially those from developing countries not targeting the mainstream Anglo-American market, may accordingly adjust their financial expectations about international recording ambitions and contracts and can seek other revenue streams.

**Box 3.1<sup>18</sup>****Recording music: Who earns what?**

Looking at case A in table 3.4, we start upbeat with a 12 per cent royalty on a \$16 CD. The producer will earn a flat fee as well as a producer's royalty, typically 3 per cent, of the absolute royalty. Then, from the remaining 9 per cent, there is a 10 per cent to 25 per cent "cost of packaging" deducted, which leaves the artist on average 7.43 per cent. The justification is that the royalty should be based on the recording and not on the sales appeal added by the packaging. In return, the record company typically absorbs all the costs of artwork and packaging. The next deduction of, on average, 15 per cent is for "free goods" and this leaves the artist with 6.31 per cent. Free goods are records given away to retailers in order to enhance promotional campaigns and enable sales or special discounts for a limited period. Retailers are also entitled to return unsold CD stocks, and artists are not paid any royalty for these. To make a provision for such returns, record companies hold back a percentage of royalties, say 35 per cent, leaving the artist with a 4.10 per cent royalty or \$0.66 per printed and distributed CD.

While technical costs and facilities have become less expensive with improvements in digital recording technologies, substantial sums can be spent on human skills needed to produce a professional product. These may be various engineering skills, arranging skills and the skills of session musicians. Record companies may express or prescribe preferences for a sophisticated (and costly) recording and production environment in order to ensure an even and commercially viable product, eventually reducing the leeway that artists may have in managing the disbursement of their advance. Sometimes one part of the advance may be used exclusively for recording and will be placed in a special recording fund.

A professional recording and master ready for CD reproduction can easily cost \$100,000. Thus the artist will need to convince the record company to print and distribute at least 250,000 copies of a CD in order to generate an income of \$64,093 before management, legal and promotion expense are deducted. If the artist is also the composer, he or she may receive additional royalties in accordance with the mechanical rights contract. If the CD does not sell much over 140,000 copies, the artist-cum-songwriter is indebted to the company and will try to make good with the next recording, supported by a new advance. Revenue from the new CD will go to returning all outstanding advances, including those from past projects under the same contract.

The figures and relative proportions in table 3.4 should not be taken to represent any real-world average. Readers may replace figures and generate their own worst- or best-case scenarios. The calculations assume that the artists compose and arrange their own material. They also assume a 50 per cent commission on songwriting royalties (lines 20 and 29). Publishing royalties in the table are fixed at \$0.60, as is the practice in the United States; other markets may offer different or better terms and conditions. Royalties for public performance and broadcast are not included since the conventions on these vary from country to country. Not all costs on the artists' side are included as they may vary as well. These may be costs of subsistence, equipment, training or hiring of additional arrangers and musicians during recording. Costs of manufacturing (line 21) at \$3 per CD become overstated with larger quantities and may drop to \$2 or less (line 21, case D). Artists' costs for promotional activities (line 17) can also vary greatly as either a proportional or fixed contribution to the overall budget activities (line 27) and are subject to negotiation. The overall promotion budget size (17+26+27) can vary during the life cycle of a CD, with potentially ambiguous results for both artists and companies. The record company may impose other deductions on artists, such as those for breakage of CDs in shipment and for the risk of using new technologies. Budgets for promotion can be as much as 20 per cent of wholesale revenue (line 20) for productions with popular commercial potential. Depending on the negotiating power of the artists, all, some or none of these will be recovered from artists' royalties. If the total promotional costs in case D were to be split half-half between the artist and the record company, the artist would incur a net loss of \$95,100 while the music industry income would rise to \$1,765,100.

If the recording artists are also the original authors (composers) of their music they may seek to earn from the sales of sheet music, broadcast, third party performance, synchronization (e.g. use in films or advertisements) and re-recording (i.e. cover versions) of their works.<sup>19</sup> In order to realize this, artists need to assign their interests as songwriters, through a publisher, to a licence-collecting organization, which would then be entitled to collect the corresponding royalties. The publisher may be an affiliate of the record company, an independent publisher or a company owned by the artist. Even from a superficial glance, it is obvious that the interaction between the different recording and publishing interests can lead to a variety of tensions and situations. The record company may naturally prefer to have the artist publish with its own affiliated publisher. It may

also discourage artists wishing to retain copyrights and ownership of their material by offering less advantageous mechanical rights contracts for recording self-written material, usually referred to as "controlled compositions".

A lack of a dependable licence-collecting infrastructure can be a sufficient motive for artists in developing countries to leave their home countries and re-establish themselves abroad. Musicians will also emigrate to seek the most traditional and historically oldest revenue stream: giving for-pay concerts. Concerts can still have revenue potential for artists whose music need not compromise its expression in order to fit into current trends and musical fashions. While the need to give concerts may be a forgone conclusion for musicians in developed countries, it can indeed be a problem

**Table 3.5**  
**How many sales for a hit record?**

	Gold	Platinum
United States	500 000	1 000 000
Germany	150 000	300 000
United Kingdom*	100 000	300 000
France	100 000	300 000
Japan	100 000	250 000
India**	100 000	200 000
Brazil	50 000	125 000
Australia	35 000	70 000
South Africa	25 000	50 000
Argentina	20 000	40 000
Ireland	7 500	10 000

\* Includes only full-priced vinyl, cassette and CD sales. *Mi-priced and budget media need to sell double this quantity for the same rating.*

\*\* Does not include film soundtracks.

for developing country artists owing to various restrictions on travel and labour regulations. Temporary work visas in developed markets are granted to commercially successful, internationally renowned or culturally significant performers. However, this may not extend to supporting staff such as technicians, management or even accompanying musicians or family, if these are not an established element of the group or ensemble performance.<sup>20</sup> Thus permanent emigration is seen as a neater solution. Developing countries may have a policy preference to keep as many artists living and creating at home, while performing internationally, rather than emigrating altogether. At the level of international trade policy, performing music abroad falls under “mode four” of the General Agreement on Trade in Services, whereby services are agreed to be provided “through presence of natural persons of a Member in the territory of any other Member.”<sup>21</sup> Governments of developing countries may choose to promote the fullest liberalization of “mode four”, in particular when confronted with monolithic requests for full liberalization of trade in creative and cultural goods or delivery through commercial presence.<sup>22</sup>

The financial success of concerts and touring depends on the ability of audiences to “discover” the artists and their music, and on enticing them into attending. Music discovery was traditionally done by radio as well as through music societies and fan clubs. Today, music television channels

can be ultimately decisive for artists’ discovery. But it is the Internet and its associated technologies, which will be discussed in greater detail in part E, that promise vastly improved possibilities for artists to approach and establish a more intimate relationship with their audiences. In comparison with radio or music television, using the Internet is affordable and accessible for many artists. The Web allows artistic control and expression. It also permits audiences to conduct their discovery experience in their own time and at their own pace, unforced by radio and television programme scheduling. However, it is not a trouble-free zone as the Internet is not necessarily a public domain and its components, ranging from the domain name to the content files, can become corporate property through recording or publishing contracts.

#### D. The development of music technology

The objectives of applying technology to music have remained the same over centuries and apply equally to digital technologies and the Internet. The first objective is to improve the physical and creative interaction between musicians and their creative medium. The second is to increase outreach and discovery, and improve the musical experience of the audience.<sup>23</sup> The following discussion explains how music moved to the digital medium incrementally and in a purposeful way, intertwined with the evolution of very closely related information and communication technologies.

Modern music technology started to develop with the broad deployment of electrical power.<sup>24</sup> But it was the invention of the phonogram by Edison in 1877 and its successor, the gramophone, by Berliner in 1884, and radio technology by Marconi and Tesla in the 1890s that pushed music into fundamental and irreversible technological development. These had two important consequences. The first is that they achieved a spatial and temporal dissociation of artist and audience. The second is that they helped improve outreach. Coincidentally, both also relied on the crucial invention in 1907 of the vacuum tube, the predecessor of the modern-day transistor, which allowed the amplification of minute electrical signals received on radios or played on gramophones, as well as the development of modern-day computers. Valve

and transistor technology allowed fewer musicians to play to larger settings and audiences than previously possible, through the development and use of vocal and instrument amplification. Together with radio, these developments changed the commercial parameters of the music business. Concerts in large venues in urban areas, where popular interest could be better satisfied, became a reality. Sales of phonograms became an important source of revenue. Finally, by airing phonograms, radio stations no longer required the physical presence of performing artists in their live studios and greatly diversified their broadcast content.

Continued innovation led to several important technologies prior to the digital revolution. In fact, the controversial “rip, mix and burn” marketing of Apple, which some interpreted as promoting piracy,<sup>25</sup> or equally Burton’s disruptive Grey Album music<sup>26</sup> have an established ancestry. Apple and Burton are distinctive in that they democratize the underlying technology and its use, and challenge our notions of what is fair and acceptable in creative activity, but they are not foundational.

The critical music technologies in the second half of the twentieth century were magnetic tape and multi-track recording, followed by the development and commercialization of electronic instruments. Recording on magnetic tape enabled the emergence of *musique concrète*. Also known as electro-acoustics, it consisted of music produced from editing together tape-recorded fragments of natural and industrial sounds. Pioneered by Schaeffer in the late 1940s and 1950s, it was the first music that exclusively used technology as a creative medium.

Multitrack recording, whereby several separate performances of any number of instruments or voices playing the same composition can be recorded in perfect synchronization on separate “tracks”, and later mixed to achieve a desired “soundscape”, dramatically changed the approach to musical composition and production. AMPEX Co. and Les Paul, an accomplished pop, jazz and country guitarist, introduced the first multitrack recorders in 1954. An important effect was, again, the temporal and spatial dissociation of musicians, some of whom would never meet in person yet would be performing “together” on the final product. While creative critique sometimes finds fault with this approach (Théberge, 1989) it has permitted well-crafted and

technically accomplished results, with the Beatles’ *Sgt. Pepper’s Lonely Hearts Club Band* and Jimi Hendrix’s *Electric Ladyland* being frequently cited as pioneering works embracing these new technologies. Another development that used multitrack recording technology to dislocate space and time, as well as purpose, was Zappa’s pioneering of xenochrony, whereby unrelated instrument performances from different musical compositions are taken out of their original context and reassembled into new compositions.<sup>27</sup>

Electronic instruments, or synthesizers as they are commonly called, used technology derived from electronic analogue computers and laboratory test equipment.<sup>28</sup> Their creative purpose was twofold. The first was to produce purely synthesized timbres that did not resemble or copy real-world sounds. The second was to imitate common instruments in order to provide cheaper and more manageable music production, the idea being that an accomplished organ or piano player playing a synthesizer with acceptable string or organ sounds could resolve the logistical or physical variables and problems of organizing a string ensemble or accessing a church organ. While many, if not most, synthesizers were developed to be “generalists”, each model eventually had its own “sound” and idiosyncrasies. This led, again, to ergonomic complications and prompted the entry of the first digital technology devised specially for music: MIDI.

The MIDI (Musical Instrument Digital Interface) standard was launched in 1983 and was developed by a group of leading synthesizer manufacturers. Its initial objective was to enable musicians to link different synthesizers together and play all of them using only one keyboard. To do so, it set out a communications standard and a physical interface standard. An immediate benefit was the development of sequencers in the form of dedicated hardware or as computer software. Sequencers generate music on a synthesizer by sending it a stream of MIDI instructions, each instruction defining the pitch, duration and timbre of a note or a group of notes to be played, in a timed sequence. These sequences can then be saved as a computer file. Sequencers enabled the pre-programming and computerized performance of complex musical passages. They also enabled the endless editing and rearrangement of a particular performance. MIDI song files are small and portable, and thus were not restricted by modest computer chip or disk memory capacity.

The next important musical technology developments were digital sampling and the closely related development of the music compact disc, or “CD” as it is commonly known. The music CD was introduced in 1980 by Sony and Philips and mass production was underway after 1982. The original sampling synthesizer was the Fairlight CMI, which was first available in 1979. Both inventions rely on sampling: the process of converting, in the case of music, sound into digital information and, on playback, back into sound.<sup>29</sup>

This transformation of music into digital information, through MIDI but more so through sampling and music CDs, enabled its convergence with personal computer technology. On the recording technology side, sampling and MIDI merged into computer software that today handles both pre-programmed and sampled human performances in the same musical composition. In a further spatial and temporal detachment, computer-based recording has achieved non-linear and non-destructive editing. Particular musical fragments can now be moved around or duplicated in time with seemingly endless possibilities of undoing, just like the cut-copy-and-paste functions used in any word processor to edit and finalize a text.

The treatment of music as “files”, using personal computers with CD drives and specialized software for ripping,<sup>30</sup> editing and re-recording music, has enabled audiences to manage their listening experience with improved interactivity. The development of compression techniques, such as mp3, that reduce music CD file sizes by 90 per cent and the development of user-friendly software and of high-capacity portable music devices, such as the iPod or Nomad, have led to an increase in audiences owning their listening experience, removing the limitations of the original medium – for example, the compact disc or radio – regarding how and when music is enjoyed.

Finally, p2p technologies and the growth of broadband Internet connectivity have generated a broad range of responses from audiences, artists and industry. p2p allows every connected computer, even one with a simple telephone dial-up, to become a node and a server. Some would argue that this is essentially a fulfilment of the original technological objective of the Internet. This tech-

nological decentralization of the Internet inevitably leads to greater empowerment of users and a reduction of possibilities for control and management of information flows and content. Because the music industry has relied on the imperfections and inefficiencies of carrier media and distribution technologies to add value, control processes and generate revenue, it has not welcomed the progress and popularity of p2p applications.

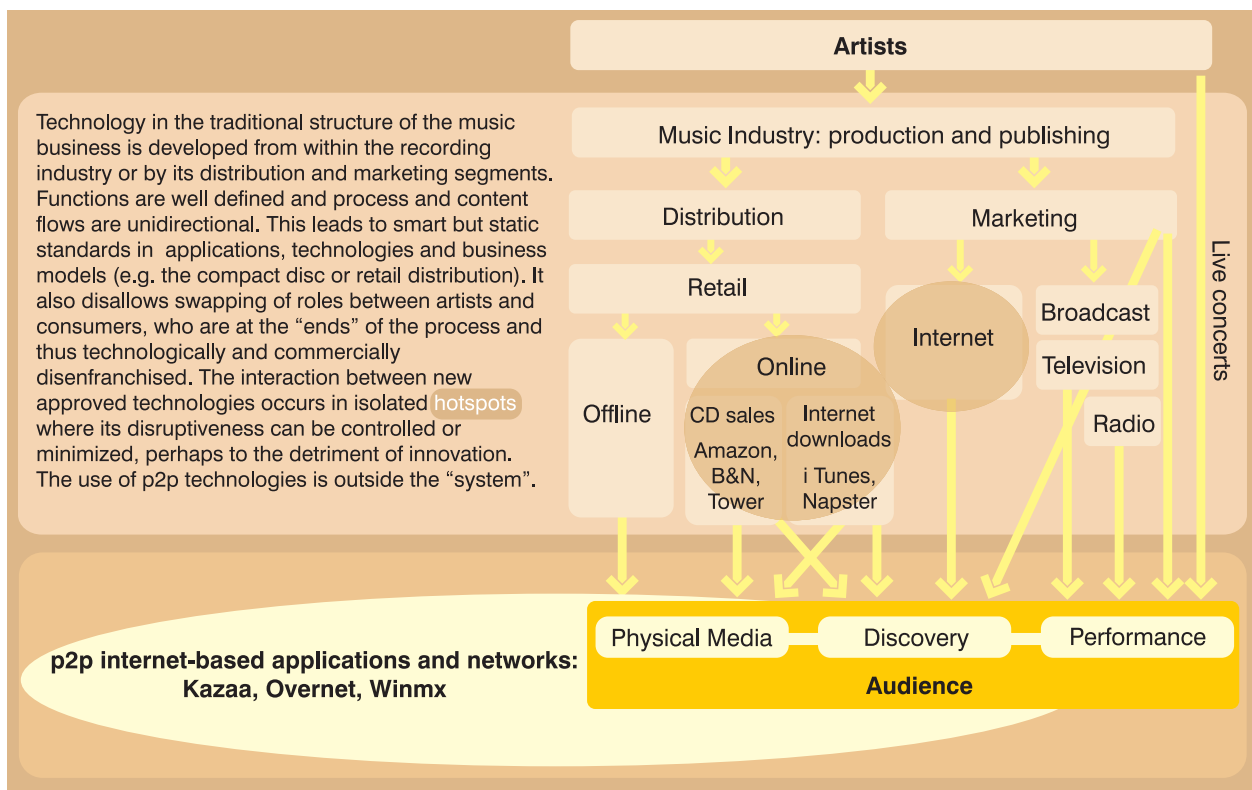
To digress, most technology developments have found important use in the processes of music creation, distribution and consumption, often satisfying diverse and different needs of artists, industry and audiences. For musicians, spatial and temporal dissociations may reach new heights with collaborations made possible by transmitting sound files using the Internet and generating joint performances using the conduit of cyberspace. As the renowned producer and artist Wyclef Jean explained, “We’re in the hard disk Pro Tools generation now...you can be in Tennessee and I can be in New York, and if you get an idea you can play the part and email it to me and I can add to it and send it back to you. I do that with Missy [Elliot] all the time.”<sup>31</sup>

For the music industry, the Internet has also generated an enormous potential for outreach and marketing. Most technologies have enabled freedoms by reducing the restrictions of time and space for these same processes. The social role of music may also be changing as technologies support individual experience while reducing opportunities for human interaction and collective cultural gratification. What few clearly expected was the effect of the rapid development and simultaneous deployment of the broadband Internet and p2p networks. The next part of the chapter will discuss the disruptive effects of the Internet and the threats and opportunities presented to the music business.

## E. Internet, music and change

The disruptive nature of the Internet and Web technologies can be best appreciated by comparing the structure of the traditional music business with that of the Internet. What we see today is the process of music exploring ways to use the Internet and assimilating and incorporating certain characteristics. Charts 3.3, 3.4 and 3.5 describe

**Chart 3.3**  
**Music industry structure and processes**



some basic structures and establish links between processes that are central to change.

Looking at the bottom of chart 3.3 we can recognize the modes in which consumers engage with music as an art and entertainment, as well as channels used by artists to deliver, interact with the audience and establish feedback. The most commonplace mode, ever since the mass commercialization of the gramophone, has been the acquisition and enjoyment of physical media, most often in the form of a music CD and to a decreasing extent of cassette tapes and vinyl records.

Another important mode is that of discovery. The quantitative disproportion between available music and a person’s capacity to select and appreciate it has already reached an immeasurable magnitude. The freedb.org database of music CDs, an open database maintained by users and published under the General Public License,<sup>32</sup> alone lists more than 1.3 million titles.<sup>33</sup> The online retailer Amazon.com offers several million book, music and film titles in various media. Thus the process and capacity for discovery are crucial for establishing an artist and securing consumers’ financial preferences vis-à-vis other artists

or genres, or even other types of experience or entertainment, such as film, sport and other hobbies, learning or recreational activities.

Finally, the experience of physical performance of music is a fundamental mode of engagement that, while sometimes enhanced by digital technologies, offers the human interaction and artist–audience feedback that is missing from, say, listening to a compact disc or surfing the Web. Performance offers an opportunity for musicians to directly generate revenue, either by playing for an audience or by playing as hired musicians in recording studios. Performance-based revenue is crucially important when we recognize that the recording industry manages profitability on only 5 to 10 per cent of its portfolio, a fact which indicates that the majority of actually signed artists cannot count on earnings from CD sales. Any revenue achieved from selling compact discs is typically used to pay back advances as described in part C of this chapter.

It is also important to recognize that music has an important social role in all cultures and that its accessibility to collective appreciation is an important element of its popularity and universality. Whereas collective experience in the past was only possible during a performance, Internet and digital

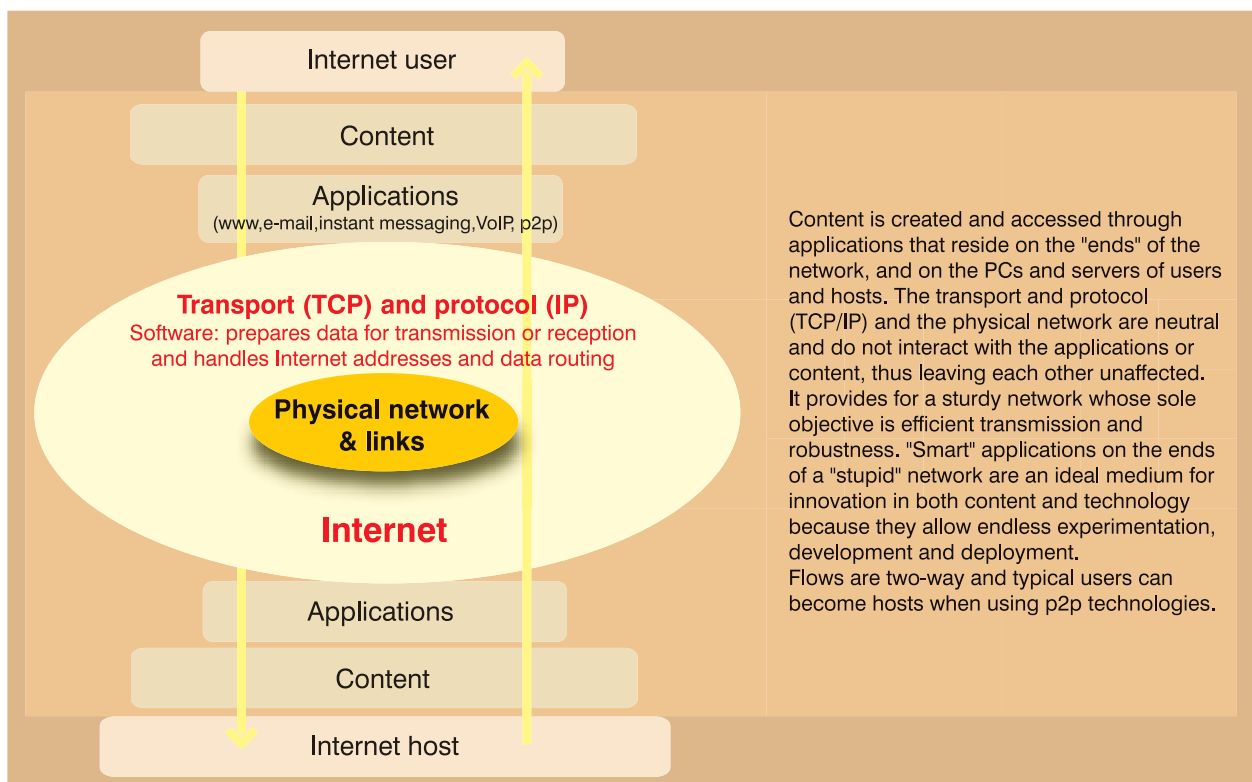
technologies enable a near-collective experience through online communities (discovery) and file sharing (media). The three modes of physical media, live performance and discovery do not have clear boundaries. Indeed, it is easy to see how performance can be a discovery experience for consumers, or talent hunters from the recording industry. It is also debatable whether for-pay download services, such as iTunes or Napster, are used to obtain content or are made for discovery that may eventually lead to the purchase of a compact disc or a concert ticket.

Looking again at chart 3.3 we find a fairly intact traditional music industry that has seen some adoption of Internet technologies. It still relies heavily on distribution through retail, and marketing discovery through broadcast channels. The most obvious advance is in e-commerce retail, where music compact discs are sold online and delivered by postal mail or courier. E-commerce retailers frequently offer previews in the form of short and low-quality audio downloads, editorial reviews and discussion and appraisal forums for amateurs and fans in order to assist discovery.

They also offer genre-based portals and guidance for consumers as well as the possibility for individuals to construct their own portal of critical appraisal and recommendations. Another technology used as a marketing-discovery aid is the tracking of browsing behaviour and the analysis of purchase patterns of consumers. On the basis of such intelligence, online retailers try to second-guess and promote artists to individual consumers by e-mail or during a browsing session. Dedicated artist websites have also emerged and their role is mainly to engage in distribution and marketing activities within the framework of traditional industry structures. A number of notable exceptions are described in section F.

Traditionally, most of the technology for production and distribution of music is owned and managed by the established business of recording, marketing and distribution and therefore, historically, most of the innovation – such as FM Radio (invented by RCA) or the music compact disc and cassette tape (developed by Sony and Philips, and Philips) – occurred in this locus as well. What is not

**Chart 3.4**  
**The layered structure of the Internet**



so obvious is that any process that pushes production and distribution technology out to the ends of the system, to artists and consumers, can undermine traditional structures and business models. Chart 3.4 describes the Internet and allows some insight into its radical concept and nature. The future structure of the music industry will be a result of the interaction of the Internet and the traditional industry, and a brief appreciation of the Internet's design is fundamental to gaining an insight about possible changes in the near and medium term.

The defining characteristic of the Internet is its freedom. It realizes this through a layered structure, the openness of the Transmission Control Protocol and the Internet Protocol software (often abbreviated as TCP/IP), its end-to-end environment for applications and content and its dominant open and free application – namely, the World Wide Web (Benkler, 2000; Lessig, 2001; Solum and Chung, 2003). The layered construction is established in such a way that innovation and improvements in any layer do not require adaptive responses in any other layer to maintain existing functionality. Adaptation is considered only from the point of view of taking advantage of the improved environment to provide better functionality, content or service. Thus, a change in the Internet protocol – for example, the deployment of IPv6 – will not require a rewriting of websites. Similarly, the development of a new web browser does not affect the functionality of the TCP with regard to how it manages data packets. A new optic fibre cable in the Indian Ocean will not require any change in the content of websites or the html standard. The TCP/IP software that manages data transfer and the physical network that carries the data do not “know” what these data mean. In order to “sniff out” data, an agency may need to establish a user or a host and develop applications running on computers above and connecting through the TCP/IP layer. Cementing its openness, the TCP/IP software and its source code are in the public domain, while the HTML code of many websites is accessible through a browser.<sup>34</sup>

Most critically, the end-to-end nature means that applications and content are developed, installed and run on computers that are on the perimeter of the network. The consequence is that new technologies for users and hosts – or by analogy, consumers and artists – can be developed regardless of

the network. There are no real obstacles in developing a new web browser or establishing a new website, as far as the physical network and data transport layer are concerned.

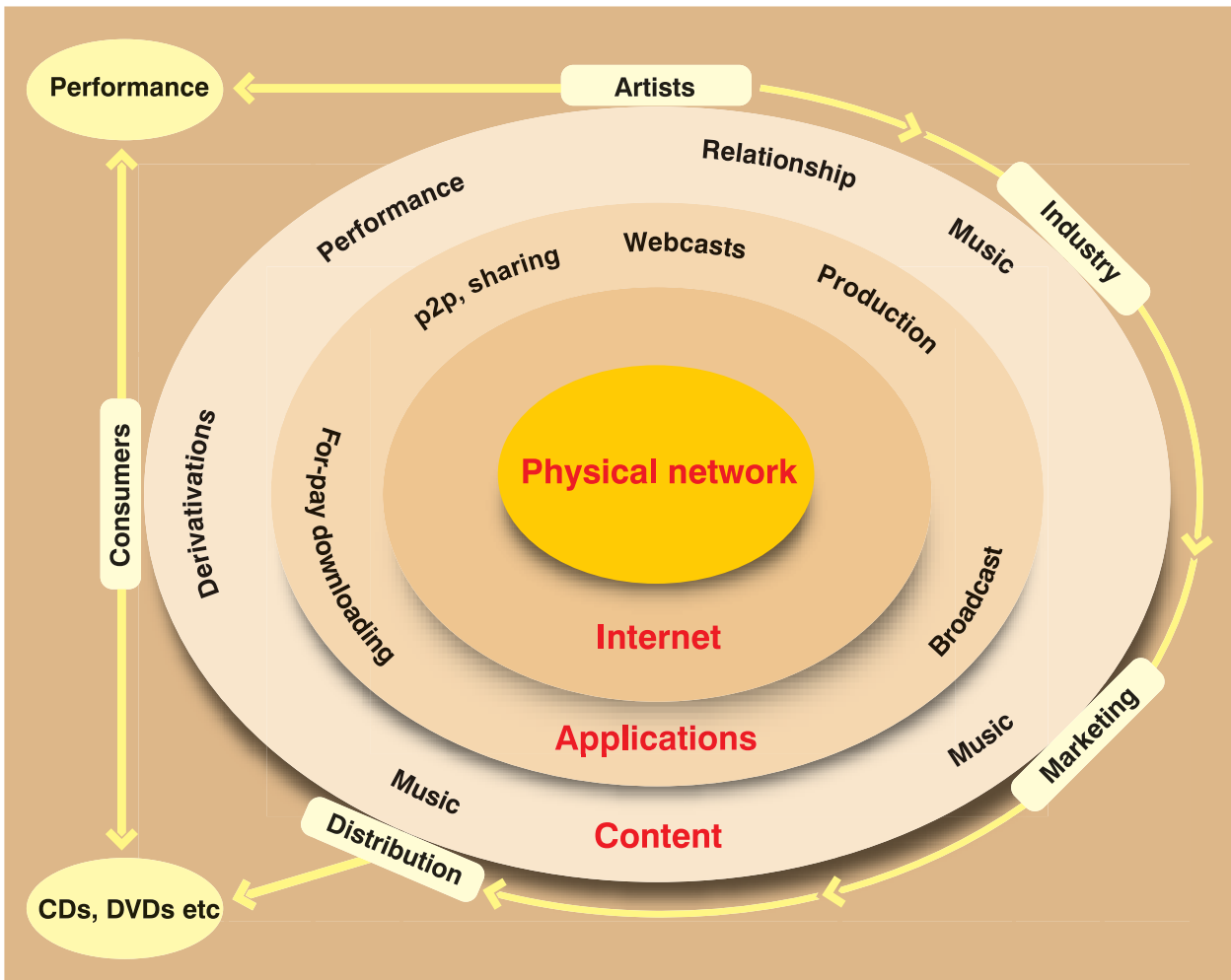
The Internet still has two broad classes of computers. There are those that are used only for browsing and are typically linked through a telephone dial-up, DSL or cable ISP service. Then, there are those that are servers that store and hand out websites to browsers. But two new technologies are blurring this distinction. The first is the availability of always-on flat-fee broadband connections for subscribers. Matched with a fixed IP number, such computers become de facto servers. Peer-to-peer technologies for file sharing (Kazaa, Morpheus, Overnet) or telephony (Skype) are capable of converting even a modest home PC with a dial-up Internet connection into a server, albeit a modest one. Because of the end-to-end nature of the Internet, such p2p applications are developed and run irrespective of the technology of the lower layers. Beyond the policy and control of the owners of the computers and the contract conditions with their Internet service provider (ISP), there is little in the network itself that can be used to technically restrict or control applications and content.

These technical and conceptual freedoms and openness are the driving forces of much of the information revolution of the past ten years. Indeed, who would have invested in developing e-commerce storefronts or media player applications tied down by technical or legal restrictions enforced by optic fibre operators or hardware producers? Information systems based on closed technologies, such as non-Web services provided by CompuServe or Prodigy, have disappeared and open and free technologies are gaining favour in all fields that are touched by the Internet.<sup>35</sup>

The question is, how will this affect the music industry and how quickly will changes come about? The assumption is that the fundamental nature of the Internet will not change in the medium term. This is an issue in itself – it is related to the increasingly important discussion on Internet governance and cannot be done justice in this chapter. Chart 3.5 speculates by exaggerating certain established trends. The first obvious change is that the unidirectional production and flows described in chart 3.3 will cease as artists, consumers and industry become increasingly net-



Chart 3.5  
Music industry affected by the Internet



worked through Internet technologies. The second is that the functions of production, distribution and marketing in chart 3.3 will “become” applications, more neutral and less subject to the uncertainties of the interaction between artists and business. Thus, technology moves out from the industry and becomes the shared property of all who wish to participate in music, creatively and commercially. p2p technologies will become internalized as some form of contract and compensation mechanism evolves to legalize and accommodate file sharing of copyrighted content. Matching this development, we see an expansion of the production of derivative works by fans. While digital derivation remains a legally dubious activity, and a plainly illegal one if derivative compositions contain recognizable samples and are publicly redistributed, it is technically achievable with off-the-shelf software and computer hardware. Another new type of content is the development of greater interactivity at artist websites, including various

marketing devices and e-commerce capabilities. Many such websites have developed to the point where the online activity they generate can be called an artist–audience “relationship”. Moreover, many artist websites have become the prime locus of their interaction with the public, circumventing traditional marketing and broadcasting support provided by the music industry, the amount depending on perceived commercial potential.

The most discussed disruptive application has been that of file sharing using peer-to-peer technologies. File sharing is an excellent example of the capacities for innovation provided by the end-to-end and layered characteristics of the Internet. In combination with the development of software for extracting files from CDs and DVDs, file sharing has prompted the music industry to research into digital rights management (DRM) technologies that technically restrict the use of digital

media and invest in litigation. However, the music industry has scaled down its efforts to litigate against p2p technology providers following a defeat in the court case against Grokster and Streamcast, and has turned to litigation against individuals who have violated copyrights and licences by redistributing music without permission.<sup>36, 37</sup> However, suing customers may not be a sustainable business model. Because companies have a different strategic relationship with clients than they do with competitors, suing clients may not generate positive public opinion and could alienate potential consumers.<sup>38</sup> Developing commercial and technical solutions that support Internet-based distribution may ultimately present better value for artists, audiences and industry. Specific cases of Internet applications are discussed in the next section in order to highlight possibilities and current practice.

## F. Technologies and applications

The history of technology adoption in music is one of artists and their audience using computers and the Internet to enhance, share and thus popularize their creativity, and of the reactions by the mainstream industry to limit any perceived or potential damage. The controversies that we see today over p2p file sharing have precedents in the disputes about radio, in particular FM radio, and video-cassette recording (VCR) technologies.<sup>39, 40</sup> While it may be exaggerated to accuse the music industry of luddism, especially since much of today's recording and distribution technology was developed by the industry, which continues to refine it, the technology it did develop in the past was either financially inaccessible to individuals or restricted through regulation. Not everyone could run a radio station, while duplication of videotapes and vinyl records required substantial investment. In contrast, just about any individual in the developed world, and many in developing countries, can establish a website offering musical content that is produced on a personal computer at a technically acceptable level. Computers and the Internet have changed the economics, and artists and audiences are enjoying unseen technological freedoms. Empowerment often has something to do with rights, and copyrights and permissions are foundational elements of the music industry and will be examined in section G.

The mainstream recording industry indicates that setting up legitimate for-pay online music portals is a significantly more complex task than designing a peer-to-peer protocol and designing the client program to be installed on a user's computer.<sup>41</sup> A recent industry publication describes several elements that need to be in place before Internet distribution can achieve the required levels of service and quality. The first issue is the need for a large digital catalogue: consumers will be disappointed with limited content. The second is the need for high-performance Internet infrastructure. The third issue is supplying safe and virus-free files, and a fourth one is providing secure payment systems. The fifth issue is the development of a consumer-friendly digital rights management system. Finally, the greatest problem is clearing recordings and compositions with various copyright holders. Suffice it to say that, with the partial exception of the last two issues, none of these considerations are novel or specific to music. Indeed, finding a good balance between DRM and consumer utility, since these are practically opposite notions, requires wisdom and experience. However, clearing rights should not be a problem for an industry where a few companies and their affiliates own the majority of recording and publishing rights.

The discussion that follows will review several technologies and portals. The first – free software – has been at the root of many of the copyright issues to be discussed in section G. Two of these – Napster and MP3.com – have suffered a heavy legal onslaught from the music industry. While they may regain prominence in the near future, their nature will bear little resemblance to their original incarnations. The third – Apples's iTunes Music Store – has got off to a good start, in part because its Chief Executive Officer (CEO), Steve Jobs, has managed to establish communication with the mainstream music industry, being a media insider as CEO of Pixar, the hugely successful animation company. An insightful development is the Brazilian download portal iMusica. It clearly demonstrates that music and Internet distribution are not the proprietary domain of developed markets.<sup>42</sup> File-sharing technologies such as Kazaa, Morpheus or Wipit will also be briefly considered. The discussion will then review several interesting directions taken by individual artists in embracing Internet technologies and engaging their audi-

ences with media, discovery and performance. Several Internet portals dedicated to promoting unsigned or undiscovered talent as well as operations with a business-to-business profile will also be reviewed.

## 1. Free and open source applications<sup>43</sup>

A number of digital technologies used in recording and production are functionally independent of the Internet. Most of these technologies are, unlike the Internet, proprietary. This means that their source code is secret and their use is subject to licences and copyrights. However, a number of new software applications for use in music have been developed as free and open source software (FOSS) – software that does not hide its code and whose licence permits redistribution, copying and sharing of improved or altered source code. Box 3.2 describes several applications that can be freely used, but also altered and adapted to local language, needs or user habits. As with any instrument, the output of these programs will depend on the creativity and inspiration of the artist. Indeed, some of these programs may not yet provide all the functionality as the proprietary industry-standard applications. However, from a didactic perspective, they are well placed for use in educational institutions dedicated to music and computer science at all levels. Experience in creative use or programming can be fed back into improving these programs. Finally, the skills acquired by using any one of these programs is highly relevant and transportable if the opportunity arises to work in a mainstream music industry technological environment. FOSS programs may have particular value for developing countries as they allow localization and, given their affordability, can be tried by aspiring or established artists or “tech-savvy” amateurs without their having to invest significant means, beyond their own time and effort.<sup>44</sup>

## 2. Napster

The first major disruptive Internet technology to affect the music industry was Napster. Today, Napster is a legitimate for-pay music download portal that bears little resemblance to its initial incarnation. First released in May 1999, Napster was created by Shawn Fanning as a file-sharing service. Its initial success was enabled by the growth of Internet connectivity and by the devel-

opment of the highly efficient MPEG-1/2 Audio Layer 3 file compression technology, more commonly known as mp3.

The original Napster had two components. The first was the client software that was installed on users’ computers. The client allowed people to discover and download music. The second was a centralized database that provided information about which songs could be found on what computer and the links for downloading them. In this sense, Napster was not a pure peer-to-peer application.

It became very popular for several reasons. It allowed the general public to obtain music online without having to purchase an entire compact disc of songs, the majority of which generated little interest or attention. It allowed users to discover music with greater insight than with the very short and low-fidelity sound clips sometimes provided by online retailers. Napster enabled users to share unofficial and unreleased recordings and deepen their insight of the creativity of their favoured artist. Finally, Napster was an application developed by exploiting the end-to-end nature of the Internet. All that was necessary was for users to install the software on the computers they used for browsing the Web. Neither the physical network nor the transport functions of the Internet needed to make any technical adjustments or allocate permissions as they could not discern between data packets of web pages or song files.

Not surprisingly, the Recording Industry Association of America (RIAA) – an association of major recording companies – filed a class action suit against Napster on 7 December 1999.<sup>45</sup> The legal process that followed generated many headlines and eventually gave Napster a great deal of publicity. It is estimated that Napster use peaked in February 2001.<sup>46</sup>

The United States courts eventually ruled that the principal activity of Napster was related to copyright violation and its servers were ordered to be shut down in July 2001. After this Napster continued efforts to re-establish itself as a subscription-based music service but failed and went into bankruptcy during acquisition negotiations with Bertelsmann AG.

What made Napster legally vulnerable was its incomplete reliance on peer-to-peer technologies. Because it used centralized servers to carry searchable information and links to song files, it became

### Box 3.2

#### Free and open source software for music

An increasing number of free or open source software applications are available for making and listening to music. Most of them run on the GNU/Linux operating system. Some have been released in versions that will run in Microsoft Windows or Apple's MacOS. The following list is illustrative and not comprehensive. For a detailed assessment, readers should consult <http://sourceforge.net> or <http://freshmeat.net/>, as well as the specialized web page <http://linux-sound.org/>. A qualified review of several advanced programs for professional recording can be found in the February 2003 volume of the *Sound on Sound* music trade magazine.<sup>i</sup> Product descriptions are taken directly from the project websites with minimum edits and their accuracy cannot be guaranteed.

##### **Agnula**

The main task of Agnula (a GNU/Linux audio distribution) is the development of two reference distributions for the GNU/Linux operating system completely based on free software and completely devoted to professional and consumer audio applications and multimedia development. One distribution will be Debian-based (DeMuDi) and the other will be Red Hat-based (ReHMuDi). The European Commission originally funded the Agnula project.<sup>ii</sup> After the end of the funded period, Agnula will be continuing as a volunteer-based free software project.

Operating system: GNU/Linux; website: <http://www.agnula.org/>

##### **Rosegarden**

Rosegarden is a professional audio and MIDI sequencer, score editor, and general-purpose music composition and editing environment. It is an easy-to-learn, attractive application that runs on Linux, ideal for composers, musicians, music students, and small studio or home recording environments. It is currently in a beta release phase, in preparation for a full 1.0 release later in 2004.

Operating system: GNU/Linux; website: <http://www.rosegardenmusic.com/>

##### **Audacity**

Audacity is a free audio editor. It can record sounds, play sounds, import and export WAV, AIFF, Ogg Vorbis and mp3 files. It can edit sounds using Cut, Copy and Paste (with unlimited Undo), mix tracks together, or apply effects to recordings. Audacity is written in C and C++, using the wxWidgets cross-platform toolkit.

Operating system: GNU/Linux, Windows, MacOS; website: <http://audacity.sourceforge.net/>

##### **Ardour**

Ardour is a digital audio workstation. It can record, edit and mix multi-track audio. It is used to produce CDs, mix video soundtracks and experiment with new ideas about music and sound. Ardour capabilities include multichannel recording, non-linear, non-destructive editing with unlimited undo/redo, full automation support, a mixer whose capabilities rival high-end hardware consoles, and sound effects.

Operating system: GNU/Linux; website: <http://ardour.org/>

##### **JAMin**

JAMin stands for "JACK Audio Connection Kit Audio Mastering interface". JAMin is designed to perform professional audio mastering of stereo sound recordings. Mastering means preparing a recording for mass reproduction and is a critical and final phase in the production process.

Operating system: GNU/Linux; website: <http://jamin.sourceforge.net/>

##### **Sweep**

Sweep is a multi-channel audio file editor with a difference. A virtual stylus, replacing the ubiquitous cursor, allows users to scrub through a file and reach an exact place in a song to make an edit. The virtual stylus has been programmed to mimic the performance of a real turntable, thus enabling its use in production as well as for live DJ performance. Sweep was developed with support from Pixar, the animated film studio that produced *Toy Story* and *Finding Nemo*, and the Australian Commonwealth Scientific and Industrial Research Organisation.

Operating system: GNU/Linux, NetBSD Sun/Solaris; website: <http://www.metadecks.org/software/sweep/index.html>

##### **Mixxx**

Mixxx provides access and playback of Ogg Vorbis, mp3 and wave files for a live DJ performance. Sounds can be edited for pitch and a beat track and automatic tempo synchronization facilitates mixing in correct beat and rhythm. Filters, a crossfader, and speed controls are provided.

Operating system: GNU/Linux, Windows, MacOS; Website: <http://mixxx.sourceforge.net/>

##### **CDex**

CDex is a tool focused on ripping and converting music from CDs into an mp3 files for storage on a PC hard drive. It has built in support for many mp3 encoders and provides numerous options for managing media files. Curiously for free software, it is available only for use under Windows.

Operating system: Windows; Website: <http://cdexos.sourceforge.net/>

##### **Grip**

Grip is a CD player and CD ripper for the Gnome desktop. It has the ripping capabilities of the program *cdparanoia* built-in, but can also use external rippers. It also provides an automated frontend for a variety of encoders in order to transform ripped files into MP3s or other compressed formats. Internet disc lookups are supported for retrieving track information from disc database servers. Grip works with DigitalDJ to provide a unified "computerized" version of one's music collection.

Operating system: GNU/Linux, FreeBSD, Sun/Solaris; with GNOME; website: <http://nostatic.org/grip/>

<sup>i</sup> See <http://www.soundonsound.com/sos/feb03/articles/linuxaudio.asp>.

<sup>ii</sup> See [http://www.agnula.org/documentation/project\\_documentation/AGNULA\\_ec/view](http://www.agnula.org/documentation/project_documentation/AGNULA_ec/view).

a straightforward target for the recording industry and arguably an accomplice in the crime of copyright violation. This particular insight was well taken by the recording industry, which may have started anticipating that future file-sharing systems would very likely be based on pure peer-to-peer technologies.<sup>47</sup> Thus, on 25 June 2003, the RIAA announced that it would file civil lawsuits against individual computer users for engaging in illegal file sharing, instead of pursuing peer-to-peer software developers.

Today, Napster is owned by Roxio Inc., which is well known for the development of popular software for copying and burning compact discs on personal computers, and the reinvented for-pay Napster music download portal may make a good match for its existing business. The new portal has been in operation since 9 October 2003, and had generated 5 million downloads and attracted roughly 1.5 million subscribers by the end of February 2004. While impressive at first glance, these figures are modest in comparison with Apple Computer's iTunes Music Store.

### 3. MP3.com

Not to be confused with the file compression technology, MP3.com was set up in 1998 by Michael Robertson,<sup>48</sup> who later founded LindowsOS – a user-friendly open source operating system directly competing with Microsoft Windows – and SIPphone, an Internet telephony technology.

The website addressed the needs of both audiences and artists. With regard to audiences, it allowed anyone to download songs from its server provided that users could prove that they had the required rights and permissions because they owned a physical and legal copy. To do this, a user would put a CD in his or her computer drive. The details of the CD were then sent to MP3.com and validated as “owned” after which a personalized online folder with songs from that CD was set up. With a password the user could listen to the songs from anywhere on the Internet. Therefore, MP3.com was not giving anything that the user did not have in the first place.

By giving users access to their own content, and by inspecting this content, MP3.com was able to discover their preferences. This information was then used to promote the music of independent musicians associated with MP3.com. The services

provided to artists included hosting, charts defined by genre and geographical area, as well as statistical data indicating which of their songs were more popular. There was no charge for downloading independent artists' music and revenue was generated through online advertisements.

To implement this scheme, MP3.com needed to have its own set of CDs to copy and transfer to users' folders. Requiring users to themselves rip and upload entire CDs was seen as a technically unnecessary complication. Furthermore, MP3.com assumed that such copying would fall under users' “fair use” provisions of copyright law. On 22 January 2000, several days after the my.mp3.com service was launched, the RIAA and the major recording companies sued MP3.com for copyright infringement, claiming that the electronic copies on MP3.com's servers were in fact subject to licensing obligations.

MP3.com quickly settled with all the plaintiffs except Universal/Vivendi, with which a settlement was reached only nine months later after a court ruled that MP3.com had intentionally violated copyrights.<sup>49</sup> In a peculiar development, one year later Vivendi bought MP3.com in order to boost its online music activities and then proceeded to sue for malpractice the lawyers that were originally advising MP3.com on their my.mp3.com scheme and defence. Having little success with developing online activities, in November 2003 Vivendi sold the MP3.com domain and technology to the CNET media company. However, the archive of independent music, containing more than a million songs by 250,000 artists, was to be deleted on 2 December 2003.<sup>50, 51</sup> Fortunately, the GarageBand and Trusonic portals have acquired a legitimate copy of the archive and are asking former MP3.com independent artists to visit [www.MP3isBack.com](http://www.MP3isBack.com) and recover their music and regenerate their artist web pages.<sup>52</sup>

### 4. iTunes Music Store

The iTunes Music Store, a for-pay music download service set up by Apple Computer, was introduced on 28 April 2003. In its first year of operation it had 70 million downloads at 99 cents a piece from a catalogue of 700,000 songs from all major music companies and over 450 independent music labels. Generally viewed as a success, initial sales were limited to United States residents holding credit cards.<sup>53</sup> This was followed up with a

solid European debut on 15 June 2004, achieving 800,000 downloads during the first week. Following its successful launch in Europe, in line with its “rip, mix and burn” credo, users can save songs to an unlimited number of compact discs or iPod devices after download, although there are some restrictions on duplicating entire playlists.<sup>54</sup>

The success of the iTunes Music Store, in spite of the availability of free music files on p2p file-sharing networks such as Kazaa or Overnet, has surprised many. We can speculate as to the reasons, some of which are certainly a large catalogue and high-quality song sample previews. The iTunes website is well designed and the interface for downloading and purchasing songs is straightforward, in particular when compared to the daunting technology of certain p2p clients. Furthermore, songs are encoded and reproduced with an advanced compression technology (MPEG-4 and QuickTime 6) that some consider superior to standard MP3 quality.<sup>55</sup> Other features, such as lightweight restrictions on copying and one-click purchasing, are seen as an advantage. However, none of these are likely to remain unmatched by other online services. Thus the success of iTunes Music Store has to be linked to other issues.

One of those issues has to be the winning linkage between the iPod personal media player hardware and the music download service, from both a technological and a business perspective. It has been suggested that Apple may be tolerating losses on iTunes in order to support its best-selling iPod hardware.<sup>56</sup> The other issue is related to tapping into the almost captive Apple market. For many years, Apple users have been paying premium prices for technology that has an implied higher functionality and better user interface. The legendary relationship of trust between Apple and its devotees indicates that audiences are prepared to pay if their needs can be addressed with a well-designed and quality product. Indeed, it is entirely possible to crack the residual copy protection on tunes sold by Apple and disrupt the system. However, there is no evidence that this is done to any substantial extent. As mentioned before, an important advantage for Apple has been securing the cooperation of the mainstream music industry, no doubt through experience and capacities developed through its media sibling Pixar.

## 5. iMusica Brazil

iMusica Brazil was launched in July 2000 by Ideiasnet, the first Brazilian technology company

listed on the São Paulo stock exchange. It carries the largest online selection of Brazilian music and provides links to software for playback, creating play lists and burning CDs. iMusica carries more than 60,000 song titles. Its technology also powers the MSN Brazil, Musical MPB and Americanas.com music download portals. iMusica has licence agreements with EMI, BMG, Abril Music and Som Livre among others. Downloads cost about 0.99 Reals per song title (about \$0.33) and are provided in Microsoft Windows Media Audio (WMA) format, but not in mp3 because it does not incorporate DRM technology to control copyright; therefore, iMusica uses Microsoft's DRM 7 technology as well.<sup>57</sup> Further, iMusica asserts that WMA files have superior audio quality compared with mp3 files of the same size. Once downloaded, songs will not play on other computers. However, songs can be burned to CD for reproduction on players that support the WMA format.

## 6. Peer-to-peer networks

p2p programmes have become the focus of discontent among copyright-based industries and have been accused of being the cause and enabler of content piracy. While file sharing of copyrighted content beyond provisions for fair use is illegal in most countries, producing the software that allows file sharing, redistributing it and installing it on a personal computer are not. The major alleged effect has been the decrease in income from CD sales of record companies, and consequently a decrease in royalty payments to recording artists. Given that less than 10 per cent of recording artists manage to generate a profit for their record companies and the majority are probably not earning any significant income for themselves either, it is interesting to ask whether they should really be worried.<sup>58</sup> Indeed, a number of artists have expressed a range of levels of acceptance, from simple tolerance to encouraging the sharing of content that is purely of interest to devoted fans, such as concert performances. A list of such artists has been posted on the Electronic Frontier Federation website.<sup>59</sup>

While Napster was the original file-sharing program, Kazaa is today probably the most popular. The Kazaa client is installed on a personal computer and uses the FastTrack protocol, as do Grokster and iMesh – two other client applications – to access content on all computers accessing the peer network running on FastTrack at that

moment. Niklas Zennström and Janus Friis developed the FastTrack protocol in 2001. Sharman Networks bought Kazaa in January 2002 and has continued developing the program for the Microsoft Windows operating system. Users prefer Kazaa mainly because it is the application with the largest installed user base. At any given moment there are several million users online.

Gnutella is more a project than just another p2p application. Originally developed for AOL, it was abandoned when management realized its disruptive potential.<sup>60</sup> It too used the FastTrack protocol but eventually developed its own protocol, which is maintained and advanced by the Gnutella developers forum. The original Gnutella was supposed to be released under a free software licence, hence the “GNU” in the name. Today, a significant part of the Gnutella project is open source, including a number of clients (Limewire, Shareaza, Gnucleus). Morpheus is a p2p client that can search all the major file-sharing networks and connect with users of Kazaa, iMesh, eDonkey, Overnet, Grokster, Gnutella, LimeWire and G2. It also enables VoIP voice-chat among users and utilizes public proxy networks for privacy protection.

While most p2p applications require a user to sign up and provide some personal details, and can reveal these if needed, FreeNet, WinMX and WinNY are p2p applications that offer a certain degree of anonymity to users. This has attracted both criticism and praise from various political, economic and moral positions.

In contrast, the goal of the BitTorrent p2p system is to provide efficient file-sharing to a large group of people by having everybody that downloads a file also upload it to others. To achieve this, a small file with a “.torrent” extension is placed on a website or distributed by e-mail. The torrent file contains information for the downloading and assembly of the file as it is received from many different computers. Thus a download will benefit from a combined bandwidth of all uploading computers. Unlike in the case of FreeNet, WinMY and WinNY, the fact that the torrent files are placed online reveals the identity of the computer. Also, BitTorrent does not offer a search facility to find files by name.

p2p networks, like the Internet on which they run, do not distinguish between copyrighted, free-and-open or public domain material. But this is a

matter of choice. Unlike the networks described, the Wippit music portal aims to create a subscription-based p2p network consisting of legitimately licensed recordings. Downloads can be achieved per song starting at \$0.49. Unlimited downloads are available for monthly (\$22.99) or yearly (\$89.99) subscriptions. Wippit has a wide range of musical styles and formats, including mobile phone ring tones. Its catalogue includes more than 200 record labels, including EMI and BMG. Using the Wippit p2p client, subscribers can search for music by artist name, song title, album name, track number, genre or year. Wippit uses a central registry allowing only material that is recognized as legitimate to be swapped.

p2p applications are improving and growing in number daily, and it is difficult to see what can stop them, beyond a dramatic reconfiguration of the Internet and its protocols. In a sense, p2p is a near-final step to the goal of eradicating any difference between browser-only computers and server-computers, and turning the Internet into a truly flat network without hierarchy. This is its destiny by design. Thus, the media and music industry are faced with the option of exploring how to change their business model to embrace and profit from p2p or to seek ways to uproot and change the Internet. Public advocacy groups, such as the Electronic Frontier Federation are suggesting voluntary collective licensing schemes: in exchange for a subscription fee, file-sharing music fans will be left free to download whatever they like, using whatever software works best for them, with positive effects on earnings for copyright owners, innovation and improvement of Internet applications and growth of the global online music catalogue.<sup>61</sup> Finally, there has been speculation that free p2p networks may go the way of free ISPs – for reliable quality and service many consumers have chosen to subscribe to broadband Internet providers.

## 7. Individual artists and technology

Artistic expression is often personal, or sometimes reflects interactions of several defined individuals. The experience of music is deeply personal as well, although it has important social roles in many cultures. Thus it can be no surprise that fans willingly flock to artists’ websites, hoping to “disintermediate” their experience by establishing at least a virtual relationship with their favourites. Artists, as discussed earlier in the chapter, are no strangers

to technology and sometimes manage to develop a distinctive online presence beyond the generic boxed and tabbed e-commerce or corporate portals of the mainstream music business. The key issue for every artist portal is to provide a proper balance of media, discovery and performance modes. Unfortunately, websites of independent but established artists from developing countries are nearly non-existent, and those that have world-class functionality, such as the websites of Salif Keita and Anjelique Kidjo, are set up and managed by their record companies – Universal and Sony in these two cases.

### *Marillion.com*

Being described as “the least cool band in the world – or the best-kept secret in the music industry”<sup>62</sup> may, at first glance, not provide much leverage for stardom. What it did provide, however, was release from the restrictions of the standard contracts and business processes of the traditional music industry. After their contract with EMI ran out in 1996, Marillion formed their own label and embarked on developing an intimate relationship with their audience, often through the clever use of digital and Internet technologies. While the website can be analysed at length for content and complexity, it is far more interesting to point out several distinctive features.

The e-commerce potential of the website has been used not only to sell existing CDs, but also to raise finance to advance the production of future work to generate and advance. Marillion have pioneered pre-ordering of scheduled CDs using bonus material as premium for fans willing to part with their money in advance. Finance is obtained on the base of an artistic track record and the interest is paid in music.

Marillion make extensive use of e-mail to communicate with their audience. Audiences in discovery mode are offered a free Marillion Crash Course CD if they send an e-mail containing their name, postal address and date of birth, plus the name of the website, magazine, newspaper or other medium where they first heard of the offer. The CD is permanently updated to keep abreast of the group’s musical direction. The feedback provides basic demographic information, including data about geographical distribution – a useful tool in planning performances and tours. An e-mail vehicle, the Marillion eWeb, is used to

provide current news and information. The band members and management can be contacted individually by e-mail from the contact page.

In 2003 Marillion asked their audience to alter, edit and remix the music from their Anoraknophobia CD. In return, it offered for pay an unmixed version of the album in which the instrument and vocal recordings for each song had been separated, allowing users to recombine them and thus produce alternative versions. The most successful reconstructions were issued on a CD in July 2004 and the selected contributors received a prize of £500 per song. Marillion have managed to strike a different balance in their relationship with their audience, which in some ways reduces and in other ways increases their control over their art. Much of it has to do with empowerment assisted by digital and Internet technologies. This approach has recently led to their first top 10 chart success since 1987.<sup>63</sup>

### *Mash-ups*

Creative intervention on established works using digital editing technology is becoming a popular process, the most recent method being so-called mash-ups, which involves the morphing of disparate genres and performances in a process reminiscent of Zappa’s xenochronic experimentation. Because permissions from several copyright owners are difficult to coordinate, most mash-ups are never legally published.<sup>64</sup> Established artists seem to have caught on to the marketing and discovery power of mash-ups, in particular as it may rekindle interest in their less recent catalogue of work. Similar to the case of the Marillion remix project, David Bowie is offering the opportunity to fans to remix his work. Bowie has posted 31 high-quality 30–40 second sound samples from various compositions on his website and has asked fans to derive new songs by recombining bits and pieces of existing ones. Prizes are offered and the most successful mixes will be posted as well.<sup>65</sup> The current controversy over mash-ups was sparked by the non-commercial release of the collection of mash-ups called the “Grey Album”. The recordings feature vocal tracks from Jay-Z’s “The Black Album” laid atop music from the Beatles’ “White Album”.<sup>66</sup> EMI, the copyright owners, have threatened legal action.



### *Creative licence*

Completely different in nature and intent, the website of Neil Young ([www.neilyoung.com](http://www.neilyoung.com)) is designed to support the artistic vision of his latest work and provides little e-commerce functionality. It does provide, however, extensive commentary on the content, lyrics as well as full-length streams of all the songs, and video footage of performances. Closer to main street, the portal of folk musician Kate Rusby ([www.katerusby.com](http://www.katerusby.com)) is a well-executed and particularly navigable and discoverable structure. An independent artist, Rusby has managed to sell more than 60,000 CDs and establish an attentive audience.

Jololi, the label of the established Senegalese artist Youssou N'Dour, was founded in 1996. The recording studio Xippi was already in place, and there was clearly a great deal of interest in new Senegalese talent from overseas after the success of Youssou N'Dour's album "Wommat". The Jololi website ([www.jololi.com](http://www.jololi.com)) is well designed and provides a high level of discovery and good navigability. Artist overviews, biographies and discographies are provided with some audio clips as well. There is a definite African flavour in the design and there has been no rush to eye-catching or gimmicky presentation. Jololi has started to make inroads into the international market and has entered into licensing arrangements with various distributors throughout Europe, including Real World, World Circuit, DeLabel and Virgin.

The well-known Caribbean musician Eddy Grant has developed an extensive website in support of his label Ice Records, which he founded to carry the release in 1977 of his first solo album, "Message Man". The website ([www.icerecords.com](http://www.icerecords.com)) and label are much more than storefronts. They provide an interesting glimpse into the musical traditions of the region and the efforts to maintain the musical heritage with new productions but also by acquiring and reissuing historical recordings of artists such as Lord Kitchener or Roaring Lion. The website offers one-minute quality audio previews of almost 100 songs in the Ice Records catalogue. Grant's discussions about music in general and in the Caribbean, as well as his takes on global issues, give an interesting insight into the man and the artist, uncommon in the mainstream industry that often "produces" and public image for the artist to "match" the music and its target audience. The website gives details on the artists it produces and has e-commerce capacities enabling the purchase of CDs.

## 8. Online intermediaries and services

During the last 10 years a number of portals have emerged whose sole purpose is to promote undiscovered or unsigned musical talent or to intermediate and bring existing talent to the Internet. A number of these will be briefly described here. They may serve as examples for setting up local and regional portals in developing countries in order to promote local talent and culture. It is interesting to see where the portal owners are domiciled and to realize that the Internet and its domains are not reserved for anyone in particular, not the least for developing country artists or businesses. For example, a query on "Jamaica music portal" will return a top hit on Reggae-Train.com, a portal with a domain owned by a US entity that forwards its e-commerce to Amazon.com. Given the accessibility and the price of technology, there is nothing stopping established artists or music industries from developing countries promoting their culture and products online.

One of the first portals was the Internet Underground Music Archive (IUMA). IUMA pioneered the delivery of music on the Internet in 1993 and has hosted over 25,000 artists and 100,000 songs. It provides artists with promotional and community tools such as an individual and customized web page for posting information and files for streaming or download, sells CDs, creates message boards and fan lists, manages fan e-mail, and finally showcases artists' music to IUMA industry partners.

Another original online portal, GarageBand.com, was founded in October 1999 to create a merit-based system for evaluating the artistry of emerging musicians. In 2001, it attempted to establish itself as a new record label but failing to secure broad distribution and promotion, it was forced to shut down its website in February 2002. Fortunately, already in May 2002 the site was re-opened and Evolution Artists Inc acquired GarageBand.com's assets. GarageBand.com offers a range of free and paid services to musicians, including concert promotion and consultancy. Content evaluation is done using Internet-based peer reviews and aims to provide a well-organized ranking of the best new independent music. The process starts when a song is received. But to submit a song, an artist needs to have rated at least 30 compositions by other artists. Listeners are randomly assigned to review new songs, and rankings are produced on the basis of their ratings. While major labels and

publishers have signed many of GarageBand.com's top-ranking artists, it is the opportunity to earn unbiased feedback and recognition that provides immediate value for musicians.

On Demand Distribution (OD2) is a European distributor of online music. However, it does not run its own music portal but provides Internet-based technologies and music content to websites such as Virgin Downloads, FNAC and Media Markt, thus squarely placing it in the B2B category. OD2 provides a complete end-to-end solution, including encoding of source material, pre- and post-release promotion, distribution, and revenue, licence and royalty management. Its objective is to sell and promote its music portfolio through online retailers while ensuring that record labels and artists receive compensation. Its services and technologies support a variety of formats, including mp3, WMA and ring tones, perform encryption for secure distribution, and provide hosting and turnkey e-commerce site development. OD2 sold one million downloads through its European retail partners during the first three months of 2004, in what is a tenfold increase on the same period last year and a 100 per cent increase over the last quarter of 2003.<sup>67</sup>

Founded in April 1999, Vitaminic is a European portal for the promotion and distribution of music over the Internet. It combines content from major record companies, independent labels and unsigned artists, offering them the opportunity to promote and sell their music. It currently has 10 local websites, of which nine are in Europe (Italy, United Kingdom, Germany, France, Spain, Netherlands, Sweden, Denmark and Ireland) and one is in the United States. All the local sites reflect the individual markets in which they operate. Unusually for such a business, Vitaminic was listed at Nuovo Mercato of the Italian Stock Exchange in Milan in October 2000, shortly after receiving \$20 million of venture capital funding from four international investors.<sup>68</sup>

The opportunity to intermediate independent artists by using technology has been an obvious prospect for Amazon.com. As early as 1995, it set up the Advantage Program, a portal for artists and publishers to promote and sell their titles through Amazon.com. The Advantage Program recently hit the headlines when the rock band Pearl Jam decided to join. Before signing up new artists, it is important to establish that they own the rights to their work. Once this has been ascertained, they

consign copies of their inventory to the Amazon.com warehouse. Amazon manages any orders and shipping, and monitors inventories.

Other portals worth inspecting for best practice are Peoplesound.com, Mudhut.co.uk, Getsigned.com, Artistdirect.com and CDBaby.com. Each is differently balanced in that one will cater to audiences seeking free downloads and a discovery experience, another will push for-pay services for aspiring artists while yet another will try to establish credibility as an insider regarding future talent and trends. In most cases, musicians can manage better contractual terms and conditions than by signing with the majors or any of their subsidiaries. The trade-off for achieving a higher royalty percentage is that online promoters may not have the marketing and promotional infrastructure to match the talent. Thus, truly excellent songwriters and performers may not maximize their commercial or celebrity potential. However, they would necessarily remain in charge of their artistic development.

## G. Music copyrights, piracy and derivations

International copyright law is governed by the Berne Convention for the Protection of Literary and Artistic Works,<sup>69</sup> the UNESCO Universal Copyright Convention,<sup>70</sup> the Geneva Convention for the Protection of Producers of Phonograms,<sup>71</sup> the World Intellectual Property Organization (WIPO) Copyright Treaty<sup>72</sup> and the WIPO Phonograms and Performances Treaty.<sup>73</sup> Other legislation and treaties of importance are the European Union Copyright Directive,<sup>74</sup> and the European Union Information Society Directive,<sup>75</sup> and the Digital Millennium Copyright Act<sup>76</sup>, the Audio Home Recording Act<sup>77</sup> and the No Electronic Theft Act of the United States.

### 1. Copyrights

A general discussion on the role of copyrights in music and creative activities can be found in many places (Lessig, 2004; Vaidhyathan, 2003), including UNCTAD's own analysis of this issue (UNCTAD, 2000). While nobody can deny copyright protection a role in creative and cultural industries, it is necessary to approach this issue in a balanced way analysing the function of property in an environment where the commons, or public

domain, is an equally indispensable input into creative processes and production. Intellectual property is not an absolute, and to appropriate all content to a rent-seeking entity is a misguided ambition. “Just because some regulation is good, it doesn’t follow that more regulation is better.”<sup>78</sup>

Since copyright is often discussed from a legal and technical perspective, it may be useful to revisit its economic role and purpose. Human thought and creativity are abundant. As resources they are peculiar in that they grow with use. The Internet and ICT take this notion to its extreme. Copyright takes a free expression of the human mind and restricts its use, thereby producing scarcity. Thus it aligns two diverging historical developments. The first is the constant improvement in communication, which generates an exponential increase in the volumes of “content”. The second is the need for scarcity, which will prompt economic agents to develop and trade “content” in markets. Music under copyright is (more) scarce and therefore can have market value. Investment in its commercialization and promotion may then be forthcoming, and it could become a traded product, available to the multitude through the mechanism of the market. The Internet decreases content scarcity, while societies fearing change strengthen copyrights and develop technologies, such as DRM, to increase scarcity and counteract this trend. If the capacity to restrict and control content is finite, while content growth may be infinite, the endgame seems futile.

To complicate matters further, digital and Internet technologies have increased the scope of “copying” and clouded our notions about what it is exactly. The potential for confusion becomes clearer when we consider two more conflicting issues. The first is that modern law assigns, by default, a restrictive copyright to all published content, including everything uploaded to the Internet. Content does not need to be registered, although it may be advantageous to do so, and no obvious copyright statements need to be included. The second issue is that computers access Internet content by requesting a copy of the files contained on a web server, loading the copy into memory or on the hard disk drive and then presenting these files in a browser, thus technically breaking the implied copyright. While trivial in 99 per cent of cases, this incompatibility serves to illustrate the inappropriateness of traditional copyright specifi-

cally for Internet activities and more generally for the future information society.

There is certainly no lack of controversy about recent developments in copyright laws and regimes, the effects of which have been to increase the power of rights owners and decrease the growth of the public domain. Depending on ethical, political or economic perspectives, this can be seen as a positive or a negative process. From a developing country’s economic perspective, the short-term outcome is a net increased cost of access, with a consequential possible decrease in access to copyrighted materials, precisely because the majority of rights holders are from the developed world. The medium-term perspective is one of alleged opportunity and will depend on developing countries’ managing to develop and hold on to copyrightable content, as well as developing professional and legal capacities to collect royalty payments, enforce rights and remedy infringement.

Having copyright law in place may be necessary but is insufficient. Without a legal system that is cost-efficient and willing to provide and enforce legal remedy, compensating those whose rights have been infringed, copyright law is a paper tiger. Without publishers and collecting societies to license works, monitor use and collect and redistribute royalties, copyright rents cannot be secured. An often-cited example is that of Jamaica. Its artists represent a 3.5 per cent share of the global music market and generate about \$385 million of the royalties received by collecting societies in developed countries. Jamaica’s own collecting societies lack the capacity to manage this income. There are estimates that, with enhanced collection capacity, Jamaican artists would significantly increase their copyright revenues and generate at least a 3 per cent increase in gross domestic product.<sup>79</sup>

But not all developing countries have significant music exports. Thus, the practical feasibility of collecting societies acting on behalf of artists from developing countries exporting small volumes of copyrighted material is not a foregone conclusion. While modern copyright regulation needs to be in place to provide economic compatibility in our increasingly globalized world, it does not need to be used always, by everyone and at any price. And perhaps the modern music industry of the developed world, with its dependence on copyright

rents and concentrated markets, does not have to be the unique model for every artist or cultural milieu, particularly in places where collective experience and ownership and use of the commons have strong roots and tradition in music and the arts.

## 2. Piracy

Until recently, music piracy could be generally defined as the violation of copyrights by making unlicensed physical copies of released music – on CDs, music cassettes or vinyl records. Indeed, the IFPI Commercial Piracy Report 2003 analyses specifically physical piracy. It reports that worldwide one in three CDs is pirated. The total value of sales of pirated media was \$4.6 billion. Several of the largest developing country music markets, such as Brazil, China and Mexico, were evaluated as having physical media piracy levels of over 50 per cent.

Moving to the Internet, there is little dilemma about the illegality of sharing music under copyright through p2p networks and the activities of ripping for redistribution, uploading and downloading music without permission. On the other hand, most of the technologies that enable users to engage in illegitimate activity are legal because they have thoroughly legitimate uses: ripping, sharing and burning music and other content under fair use provisions, from media that is owned by the user or comes from the public domain. Thus Internet file sharing has led the mainstream music industry to cry foul and use its political and financial influence to assert its interests.

Legislation and litigation aimed at curbing Internet piracy of music seek validity in legal logic and theory. However, many – including the recording industry – see this as an important but insufficient argument. The power of conviction lies with proving that there is quantifiable and important economic damage done by piracy. However, calculating lost sales from the number of illegitimate files in circulation in global p2p networks requires many assumptions. Equally difficult is establishing a causal relationship between file-sharing activity and CD sales. There are too many factors that can explain away the global drop in sales. The end of the vinyl replacement market, greater time and money spent on DVDs, computer games and the Internet, or the general post-Internet bubble economic downturns are commonly cited reasons. One recent study (Oberholzer and Strumpf, 2004) has concluded that there is no statistically significant effect

from music file sharing on p2p networks on CD sales and will have no impact on the supply of music. Other studies (Liebowitz, 2003) have expressed different views but question the ultimate severity of the p2p effect on the recording industry. Finally, improved discovery using p2p networks may have prevented what would otherwise have been unwanted or disappointing purchases.

The first casualty of strengthened enforcement and litigation is the notion that copyright is needed to provide incentives and motivate creativity and innovation in music. If we consider the imbalance in contract the majority of recording artists endure, described in part C, such incentives have probably been realized only to a very limited extent. Thus, the purpose of copyright in stimulating the “innovation and creativity” of artists is downgraded to protecting the “investments” of corporations. Given that investments are made, and the corresponding financial risks incurred, by giving advances to artists recoverable from sales, the business model can easily degenerate into managing a poorly performing advance portfolio, perhaps partly because of the moral hazard presented in the security of earnings acquired through copyright monopolies in a concentrated industry. Restructuring and changing business models can be a slow and risky process and big companies may choose to let more “expendable” entities spearhead change and conduct experiments. What is successful can be eventually brought in line with what is “acceptable” through litigation or buyouts, but usually both.

The second casualty is the public domain. Strengthened legislation has only extended the scope and duration of rights held and bars content from entering the public domain. A secondary problem is that, given these extensions, seeking permissions becomes a critical legal activity that requires resources beyond the reach of many artists. Finally, keeping content out of the public domain and under copyright is pointless if the content has no commercial potential. Thus music that is “out of print” may remain trapped and eventually forgotten: a disservice to audiences and artists alike.

The third casualty is the scope of fair use. DRM lessens the need for copyright law as it overrides restrictions imposed by a copyright contract and reintroduces them through technological locks and keys. Under copyright, users rights had some flexibility and fair use could be subject to debate and litigation. Replacing copyrights with DRM technology

removes the partial but useful flexibility of a contract between people. But DRM technology is not unbreakable and thus national legislation and international treaties have been introduced and annotated to criminalize the breaking of DRM locks and the related exchange of information and tools. This can result in an unnecessary criminalization of legitimate and fair use with devices, such as computers or DVD and CD players, that run on free and open-source software.<sup>80</sup>

### 3. Open solutions<sup>81</sup>

What starts out as a binary issue – restrictive copyright or public domain – may eventually resolve itself through a balanced and nuanced approach, in particular with the assistance of Internet and digital technologies. The quest for alternatives started with the FOSS movement, which sought to give programmers and users freedoms of use by using copyright to restrict appropriation. Its counterparts in the creative industries are the Creative Commons (CC) project and open-source record labels, and are in part a reaction against what some musicians see as excessive control of music through overly restrictive copyrights that hamper derivative works. As derivation is at the heart of the creative musical processes, musicians need to reappropriate and reinterpret music and sounds to enable them to create truly innovative music. Music is, in essence, an art of derivation that is inspired by and, often unashamedly copies, existing compositions or performances. Digital technologies have not changed this; they have just made it easier. Direct quotations in popular music are not uncommon – an obvious example from the pre-Internet era is Madonna’s derivation of “Like a virgin” from the Four Tops’ tune “I can’t help myself”, or the The Jam’s derivation of their song “Start” from the Beatles’ classic “Taxman”. Jazz music is extremely derivative, while many traditional genres such as Raï or Blues have little or no sense of ownership and are based on commons. While derivation using musical ideas in abstraction can be positively argued for, the use of excerpts or samples of a copyrighted composition or recording is subject to seeking and acquiring permissions. If this is not done, the deriving artist may be asked in court to prove the insignificance of the material used in relation to the new composition, in terms of both quality and quantity. In this sense, the notions of the acceptability of using, say, up to eight musical bars or 10 seconds are misguided.<sup>82</sup>

The basic premise for the CC project is that too often the debate over creative control tends to the extremes. At one end is a vision of total control – a world in which every possible use of a work is regulated and in which “all rights reserved” (and then some) is the norm. At the other end is a vision of anarchy – a world in which creators enjoy a wide range of freedom but are left vulnerable to exploitation. Balance, compromise and moderation have become endangered species. To provide a remedy and an alternative, CC uses copyrights to create public goods: creative works that are set free for certain uses. Through a variety of its carefully worded licences, it offers artists ways to protect their works while encouraging specified freedoms of use by declaring “some (but not all) rights reserved”.<sup>83</sup>

In December 2002, CC released a set of copyright licences that are free for public use and that draw inspiration in part from the Free Software Foundation’s GNU General Public License (GNU GPL). CC has developed a Web application that helps people dedicate their creative works to the public domain, or retain their copyright while licensing them as free for certain uses, on certain conditions. CC licences are specifically designed for creative works and activities, such as websites, scholarship, music, film, photography, literature, courseware, and so forth.

The objective is not only to increase online content, but also to make access to that content cheaper and easier. To that end, CC has developed metadata that can be used to associate creative works with their public domain or licence status in a computer- or machine-readable way. This will enable people to develop and use online search applications to find, for example, songs that are free to use provided that the original composer and/or performer is credited, or songs that may be copied, distributed or sampled with no restrictions, or with clearly defined limits. Eliminating the need for legal intermediation, the CC project aims to contribute to reducing barriers to creativity.

Loca Records is an independent British record label that releases music under Copyleft licences that allow freedoms similar to those of the GNU GPL, including copying, re-release, modification and sampling, with the requirement that the new work uses the same licence. Loca’s first two releases – in 1999 – were under the GNU GPL. Subsequent releases have been on the EFF Open Audio License.<sup>84</sup> Loca is now releasing all work under the Creative Commons licence known as

Attribution-ShareAlike. One notable difference between the Creative Commons licence and free or open-source licences such as the GNU GPL is that it does not require that the unmixed source tracks be made available. Loca is planning a proper free/open-source release that will contain a selection of samples that were used to produce the compositions, together with the final music.

Magnatune is a small record label from California that produces music under a variety of licences, including the Attribution-NonCommercial-ShareAlike licence from the Creative Commons. It currently sells music for download through its website. John Buckman, CEO of the e-mail software company Lyris, founded Magnatune in spring 2003. Magnatune makes non-exclusive agreements with artists, and gives them 50 per cent of any proceeds from online sales or licensing. Users can stream and download music in mp3 format, without being charged, before making a buying decision. Even though using liberal licensing is not a new idea in itself, Magnatune is one of the first and most visible companies to try to build a business in music around this idea.

Opsound is a portal that provides links to music released under open source or copyleft licences. The website tries to facilitate open content music by indexing songs and aiding a community. Opsound has no facilities for money transfers. Most new songs are licensed under the Creative Commons Attribution-ShareAlike 1.0 licence. Popularity charts were added towards the end of 2003 and the beginning of 2004. Many compositions are available labelled as “remix ready” whereby the artist indicates the willingness to provide the unmixed source tracks on request.

## H. Conclusions

The international music industry has entered a turbulent period. No stranger to technology, it should have no problem in extrapolating past trends into future developments. The nature of its reaction is, however, a different matter. While for-pay download sites such as Apple’s iTunes have been doing well, true success will come when p2p networks and file sharing become fully legitimized through subscriptions or indirect earnings such as advertising. Unfortunately, the majors are unlikely to lead the charge, particularly since they are still recovering from the Internet bubble. This leaves the field wide open for technology companies that

may not experience unmanageable levels of anxiety from the threat of technological change.

Music markets in developed countries are in their mature phase and future growth will depend on convincing audiences to part with leisure time dedicated to other activities: a difficult proposition at best. Large music markets in developing countries have growth potential and will continue to attract the interest of the majors, provided that they can establish workable copyright environments. The international industry will continue to lobby for the elimination of any perceived trade restrictions on the import of cultural goods and services. At the same time developing nations need to re-examine GATS support for “mode four” delivery of services through the movement of natural persons in order to improve conditions for their artists’ work and travel when pursuing performance income.

Developing countries with large national and diaspora markets, such as Brazil, India and China, will improve their grasp of technology and will undoubtedly succeed in increasing international sales of CDs, as well as venture into online for-pay downloading. The artistic and cultural communities need to fully appreciate the commercial mechanics of the industry at an international level in order to assess what mix of activities and corresponding revenues (recording, composing and performing), and technologies, will maximise their earnings and provide for the greatest continuity, stability and success in their artistic careers.

The main issue will be one of scaling costs to activities and choosing the appropriate technologies. Ambitions need to be realistically dimensioned, it being understood that the majority of major releases do not achieve profitability. Given the general improbability of major earnings from recording, artists may be motivated to develop online activities more fully, assisting audience discovery and thus generating improved revenues in concert performance or will compose for other musicians. Because both traditional copyrights and liberal open-source licences’ require legislation and protection, developing countries need to have in place a legal environment and collecting agencies. Artists should not shy away from exploring open licensing under the impression that it means giving away work and music for free. The spectrum of choice is large, while the type of contracts offered by the majors to the selected few are but one variant.

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## Notes

1. Public goods are those that simultaneously satisfy the criteria of non-rivalry and non-excludability. The consumption of a non-rival good by one consumer does not decrease its utility for another consumer. Non-excludability implies that it is difficult, if not impossible, to charge people money for the use of the good. Examples of non-excludability are breathing air and walking through a public park.
2. See [http://www.pwcglobal.com/e&m/outlook/Outlook2002\\_ExecSummary\\_Final.pdf](http://www.pwcglobal.com/e&m/outlook/Outlook2002_ExecSummary_Final.pdf).
3. At the time of writing, Bertelsmann and Sony have finalized the merger of their recorded music divisions, which is likely to attract some regulatory attention on both sides of the Atlantic. Time-Warner's plans to leave the music industry may lead to some form of merger of its music divisions with EMI, or a sale of those divisions to a consortium led by Edgar Bronfman.
4. Estimate for BMG sales based on [http://www.bertelsmann.com/documents/en/Unternehmenspraesentation\\_weiss\\_e\\_300104.pdf](http://www.bertelsmann.com/documents/en/Unternehmenspraesentation_weiss_e_300104.pdf).
5. Victor was a result of the merger between Emile Berliner's Berliner Gramophone Company, which produced flat disc phonograms, and the Consolidated Talking Machine Company, which manufactured players for records.
6. See: <http://www.mustrad.org.uk/articles/gauhar.htm> and <http://www.tribuneindia.com/2002/20020526/spectrum/main7.htm>.
7. Forbes, 17 July 1995 (check original source).
8. For a detailed description of the development and business economics of Polygram, see Bakker H (2003).
9. See <http://www.abpd.org.br/dados/decada90.htm>.
10. See <http://www.ifpi.org/site-content/press/20030710.html>.
11. Figures as reported at the annual RISA meeting by by Russell Crawford, Chairman of the Anti-Piracy Sub-Committee.
12. See Letts and Ingles (2003).
13. See Letts and Nzewi (2003).
14. See *The Economist*, Rumba in the jungle, 18 December 2003. [http://www.economist.com/printedition/displayStory.cfm?Story\\_ID=2281725](http://www.economist.com/printedition/displayStory.cfm?Story_ID=2281725).
15. IFPI, *The Recording Industry: World Sales 2003, 2004*.
16. UNESCO Global Alliance for Cultural Diversity, see: [http://portal.unesco.org/culture/en/ev.php-URL\\_ID=17176&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/culture/en/ev.php-URL_ID=17176&URL_DO=DO_TOPIC&URL_SECTION=201.html).
17. Typically, a number of recordings are contracted for delivery over a specified period of time. If contractually agreed, the copyrights and the physical master recordings may revert back to the artist after a certain period. This is, however, more an exception than a rule. The master recording is the unique final product from which all copies are made. The master was usually produced on high-speed stereo magnetic tape, whereas today a number of analogue and digital formats are used. A mechanical right is the right to reproduce copyrighted material in a fixed medium, such as CDs or music cassettes. Royalties are also paid in exchange for the rights for music publishing and performance. However, the chapter will not go into this issue as it may dilute the discussion because it requires a discussion of broadcast, which cannot be done justice within the scope of this chapter. See Krasilovsky, Shemel and Gross (2003) for a comprehensive discussion of music recording, publishing and performance contracts and rights.
18. The discussion here owes much to the excellent analysis by Krasilovsky, Shemel and Gross (2003). For a more colourful description of the mechanics of the music business see Steve Albini's The problem with music, in T Frank and M Weiland, 1997; (eds.) *Commodify Your Dissent: Salvos from the Baffler*, New York, W.W. Norton and Co.; and Courtney Love's "Courtney Love does the math" at <http://dir.salon.com/tech/feature/2000/06/14/love/index.html>.



19. It may be necessary to note that there is an established musical convention for songwriting, whereby the artist does not, in principle, produce recordings for public commercial distribution under a contract with a record company. Songwriters write songs and music for sale, using the intermediation of a publishing company. The rights they sell depend on the ultimate use: mechanical rights to a record company, performance rights to a radio station, synchronization rights to a film studio, and so forth.
20. See Krasilovsky, Shemel and Gross (2003), chapter 40, "Work permits for foreign artists"
21. See [http://www.wto.org/english/docs\\_e/legal\\_e/26-gats\\_01\\_e.htm](http://www.wto.org/english/docs_e/legal_e/26-gats_01_e.htm).
22. An excellent example of this position preoccupied with opening markets rather than creating opportunities for artists from developing countries is the IFPI Response to the EC Consultation Document on the GATS 2000/WTO Negotiations concerning Audiovisual Services (Music and Recreational Software) and Cultural Services, which opens with the statement that "The European music industry urges the Commission and Member States to pursue a proactive agenda during the GATS discussions that will help to eradicate trade barriers and open up difficult markets". The difficult markets listed in the text represent 4.3 per cent of global CD sales. See <http://www.ifpi.org/site-content/library/gats-questionnaire.pdf>.
23. Technology and music have a deep-rooted relationship that goes back to before modern digital technologies. A casual visit to any museum with a collection of musical instruments will reveal the complexity and extent of the efforts of instrument craftsmen, the seminal music technologists, to improve existing design and test innovations.
24. Some may debate this and go further back in time. Undoubtedly, the pace of past improvements and innovations will seem rather slow by today's standards. For example, the invention of the piano forte by Cristofori in 1698 and its development by Silbermann in the 1730s and 1740s (Bach had apparently provided critique, although the scope of his involvement and acceptance of the instrument is controversial) led to a modern form of the concert piano that was only finalized in the mid-nineteenth century, with major improvements such as an iron frame and double action. The saxophone, a widely popular but non-classical instrument, was invented in 1846 by Sax and was consigned to use in military marching bands before jazz styles eventually increased its use and exposure, but only 70 years later. Both instruments provided greater sound volume and stability than their predecessors, to the benefit of musicians and audiences. The same developments led to music inspired by and highlighting these new capacities. For more details see <http://www.barquemusic.org/silblegacy.html> and <http://www.jackgibbons.com/composers/bach.htm>, and the online discussion at <http://www.bach-cantatas.com/NonVocal/Var-Italian-DVD.htm>.
25. See <http://www.asia.apple.com/hardware/ads/ripmixburn-long.html> and <http://www.macworld.com/2001/10/macbeat/rip/>.
26. See <http://www.illegal-art.org/audio/grey.html>, <http://www.rollingstone.com/news/newsarticle.asp?nid=19292> and <http://www.nytimes.com/2004/02/25/arts/music/25REMI.html?ex=1083297600&en=d12f9e50d04773c2&ei=5070>.
27. See [http://mixonline.com/ar/audio\\_mothers\\_sound/](http://mixonline.com/ar/audio_mothers_sound/).
28. Originally, their purpose was experimental and their use was mainly in academic study. The slow replacement of the vacuum tube with transistor technology led to reduced size and greater reliability and operational stability and increased consideration of them in mainstream use. Robert Moog created the first playable and configurable music synthesizer in 1964.
29. The speed of this process is critical for the quality of real-time music recording and reproduction. The speed, or "sampling rate", indicates how many times per second a sound will be measured or, going the other way, how many data measurements will be read and assembled to reproduce one second of sound. The bit depth of each reading indicates the size of information acquired in one read. The standard for music CDs is 44,100 samples per second, each sample being assigned one of 65,535 discreet values, i.e. "16 bits" in technical language.
30. Ripping is the process of extracting one or several songs from a music CD and copying them to a computer hard disk. This entails translating the CD format, also known as the Red Book audio CD standard (or IEC 908), into a computer file format, such as .wav, .mp3, .ogg or .wma.
31. Quoted from Sound on Sound (2004) Wyclef Jean, Producer, July issue.
32. See UNCTAD (2003a), in particular chapter 4, and the Free Software Foundation at [www.gnu.org](http://www.gnu.org).
33. See: [http://www.freedb.org/freedb\\_stats.php](http://www.freedb.org/freedb_stats.php).

34. To see the source code of a website in Internet Explorer click View > Source on the menu; in the Mozilla web browser click View > Page Source; this “bare all” nature of web pages enabled the fast adoption and broadest use of the World Wide Web and html standard as the main Internet platform. Amateurs and experts alike could learn from each other and share clever or effective solutions.
35. See UNCTAD (2003a), in particular chapter 4, and the Free Software Foundation at [www.gnu.org](http://www.gnu.org).
36. The full text of the ruling is available at: [http://www.grokster.com/files/030425\\_order\\_on\\_motions.pdf](http://www.grokster.com/files/030425_order_on_motions.pdf).
37. See Schultz (2003).
38. For a more detailed discussion on why “suing your client” may not be a good business, see practice Shell (2003).
39. For interesting descriptions of the dispute between the FM radio inventor Edwin Howard Armstrong and his one-time employer, RCA, which reportedly saw FM technology competing with its AM radio network, see <http://www.webstationone.com/fecha/armstrong.htm>, <http://users.erols.com/oldradio/ehabio.htm>, <http://world.std.com/~jlr/doom/armstrng.htm> and Lessig (2004: 4-8).
40. See Lessig (2004: 76).
41. IFPI (2004) Online Music Report 2004, <http://www.ifpi.org/site-content/library/online-music-report-2004.pdf>.
42. An increasing number of for-pay music download portals are coming online, such as RealRhapsody WalMart Music Downloads. They are similar in nature and may provide a competitive environment to the benefit of consumers. However, they are not conceptually, commercially or technically distinctive and are therefore not reviewed.
43. For a detailed examination of the free and open source software phenomenon, see UNCTAD (2003a).
44. See UNCTAD (2003), chapter 4.
45. See <http://www.lawguru.com/newsletters/2000/05/32016.html>.
46. BBC reporting of Media Metrix figures, <http://news.bbc.co.uk/2/hi/business/2234947.stm>.
47. Following a ruling by the Central District Court of California on 23 April 2003 releasing the creators of the competing file-sharing programme Grokster from liability related to copyright infringement, a change of strategy was in order. See [http://www.eff.org/IP/P2P/MGM\\_v\\_Grokster/030425\\_morpheus\\_win\\_pr.php](http://www.eff.org/IP/P2P/MGM_v_Grokster/030425_morpheus_win_pr.php) and the actual text of the court decision at [http://www.grokster.com/files/030425\\_order\\_on\\_motions.pdf](http://www.grokster.com/files/030425_order_on_motions.pdf). The decision has been appealed; details on the case can be seen at [http://eff.org/IP/P2P/MGM\\_v\\_Grokster/](http://eff.org/IP/P2P/MGM_v_Grokster/).
48. The domain name was registered on 17 December 1997.
49. See <http://www.lawguru.com/newsletters/2000/05/32016.html>.
50. See [http://www.theregister.co.uk/2003/11/15/hungover\\_cnet\\_wakes\\_up\\_next/](http://www.theregister.co.uk/2003/11/15/hungover_cnet_wakes_up_next/).
51. See <http://asia.cnet.com/newstech/industry/0,39001143,39158242,00.htm>.
52. See GarageBand to Revive Old MP3.com Archive, *The Wall Street Journal Online*, 18 April, <http://www.good-nightkiss.com/mp3restored.html>.
53. Sceptics may point out that iTunes performance should be measured against global sales of 1 billion CDs or 10 billion songs. However, sceptics may also consider that many people do not listen to more than one or two songs from any CD anyway and that iTunes downloads are expressions of real moneyed demand and interest, while 80 per cent of CD content is a forced purchase imposed by the global production and distribution monopoly.
54. See <http://www.apple.com/pr/library/2004/apr/28itunes.html>.
55. “Standard” is taken to mean sound quality as provided by an Mp3 encoded 128 kilobit per second data stream. In comparison, uncompressed data from a standard compact disc streams at approximately 1,400 kilobits per second.
56. See [http://www.theregister.co.uk/2004/06/23/apple\\_itunes\\_first\\_week/](http://www.theregister.co.uk/2004/06/23/apple_itunes_first_week/).
57. See Good-Bye, MP3; Hello, DRM! , *PC Magazine*, 458 The assertion of low overall profitability is an accepted industry figure; see <http://www.riaa.com/news/marketingdata/cost.asp>.

59. See: <http://www.eff.org/share/>.
60. See Maverick programmers prepare to unleash anarchy on the Web, *The Wall Street Journal*, 27 March.
61. For a detailed description of the proposed mechanism see A better way forward: Voluntary collective licensing of music file sharing, Electronic Frontiers Federation, [http://www.eff.org/share/collective\\_lic\\_wp.php](http://www.eff.org/share/collective_lic_wp.php).
62. See <http://www.soundonsound.com/sos/sep03/articles/marillion.htm>.
63. See [http://www.billboard.com/bb/daily/article\\_display.jsp?vnu\\_content\\_id=1000496380](http://www.billboard.com/bb/daily/article_display.jsp?vnu_content_id=1000496380).
64. See <http://www.salon.com/tech/feature/2002/08/01/bootlegs/print.html>.
65. See <http://www.acidplanet.com/contests/davidbowie/?ref=neverfollow>.
66. See [http://www.billboard.com/bb/daily/article\\_display.jsp?vnu\\_content\\_id=1000455930](http://www.billboard.com/bb/daily/article_display.jsp?vnu_content_id=1000455930).
67. See <http://www.ondemanddistribution.com/eng/press/pressdetails.asp?id=264>.
68. See <http://www.vcbuzz.com/new/vc.cgi?cobrand=icom&company=12561>.
69. The full text can be found at: <http://www.wipo.int/clea/docs/en/wo/wo001en.htm>.
70. Most of the States parties to the Universal Copyright Convention (UCC) have become parties to the Berne Convention, rendering the UCC largely irrelevant today.
71. The full text can be found at <http://www.wipo.int/clea/docs/en/wo/wo023en.htm>.
72. The full text is available at <http://www.wipo.int/documents/en/diplconf/distrib/94dc.htm>.
73. The full text is available at <http://www.wipo.int/clea/docs/en/wo/wo034en.htm>.
74. The full text is available at [http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/l\\_167/l\\_16720010622-en00100019.pdf](http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/l_167/l_16720010622-en00100019.pdf).
75. The full text is available at [http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/l\\_167/l\\_16720010622-en00100019.pdf](http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/l_167/l_16720010622-en00100019.pdf).
- 76 <http://www.copyright.gov/legislation/dmca.pdf>.
- 77 It is interesting to note that the Audio Home Recording Act did not foresee the use of computer hard drives as audio recording devices and is thus largely irrelevant to the current debate on p2p technologies and file sharing.
78. Lessig (2004), accessed on 6 May 2004, at <http://www.jus.uio.no/sisu/freeculture.lawrence.lessig/doc.txt>.
79. See [http://www.iprcommission.org/graphic/Views\\_articles/Legal\\_Times.htm](http://www.iprcommission.org/graphic/Views_articles/Legal_Times.htm).
80. See <http://www.gnu.org/philosophy/right-to-read.html>.
81. See UNCTAD (2003).
82. See Mayer (2004).
83. See <http://creativecommons.org/>.
84. See [http://www.eff.org/IP/Open\\_licenses/eff\\_oal.html](http://www.eff.org/IP/Open_licenses/eff_oal.html).
85. See <http://creativecommons.org/licenses/by-sa/1.0/>.