

DRMs and competition : a new strategic stake

The case of the online music market

Links between competition and intellectual property laws have already been studied (Eagles, 2000). They are worth being studied in the particular context of a rapidly emerging market of online music¹. They take two main forms:

- On the one hand, online distributors have to get rights to exploit contents. They must get these rights from owners. In 2001, as the online market was hardly emerging, the majors of the recording industry tried to make a strategic use of their catalogues to prevent potential competition and to maintain their positions (see Pressplay et Musicnet).
- On the other hand, online distributors have chosen to use Digital Rights Management systems (DRMs) in order to distribute music in a safe way. Then they must obtain licences from the owners of these DRMs. Moreover, these DRMs that stand out as a way to protect Intellectual Property Rights (IPR) are themselves protected by IPR (patents in the USA, author's rights and patents in the EU). This paper deals with this second aspect.

1 – DRMs : a growing market and a crucial stake for the music industry

1.1 A newly born market

On a contents distribution platform, contents may be protected by soft- as well as hardware. DRMs are not only technical means to protect the contents. They also aim at managing rights to use, to distribute and to control. DRMs are designed to grant a safe distribution of digital contents and access rights². More precisely, DRMs have three functions (OECD, 2004): First, they encrypt content to keep it unavailable from unauthorized users. Second, they provide a license system that controls the access to the content, what can be done under specific circumstances. Third, they authenticate the identity of the user, a required step to access to the different usage rights awarded by the license

- they encrypt content to keep it unavailable from unauthorized users,
- they provide a license system that controls the content, its access and the conditions of usage ;
- they authenticate the identity of every user in order to determine the extent of his access rights and of his use of data³.

On the other hand, file format, or format, is a way to encode information for storage in computer files and in our case for distribution on the internet. It corresponds to the vinyl or the CD in a digital dematerialized form. In this writing, formats are not specifically questioned. DRMs and formats often appear as bound together insofar firms that publish DRMs in the field of music distribution are often owners of the format used by their DRMs. But they can also use existing available format, like Apple with the format AAC⁴.

Most content publishers believe that the counter attack to piracy must be a technical one. Since technologies enable to circumvent IPR, they could also prevent it. DRMs stand out as a concrete application.

From a theoretical point of view, technical protections stand out as alternatives to the use of IPR. Actually they mean exclusion. In reality, the advent of international legislations that prohibit the circumvention of technical protections (DMCA in the United States, EUCD in the European Union) relies upon technical and legal protections. DRMs are extending the classical distribution model that lies upon subscription or payment made at every use. Thus they are making it possible again to exclude, in order to fight against the non-rivalry property of digital contents. Online distribution stands then out as a sophisticated reproduction of offline one.

DRMs make it also possible to version since the authorized uses are specified for every content and the tariff adapted to every use (Meurer, 1997, Bomsel, Geffroy, 2005). They constitute an exceptional and sophisticated attempt to delimit the behaviour of consumers ; DRM may govern a wide range of user behaviours such as the

¹ In this writing, we do not study the cases of sites that sell materialized music, such as Amazon.

² DRMs use mark-up languages such as XrML and ODRL.

³ This authentication is necessary for DRMs to work well. However it may cause problem – that we do not study – in terms of the respect of private data.

⁴ We must precise here that these formats are not free of IPR. For example, in the case of AAC or MP3 formats, the firms that want to produce readers capable to read files encoded in any of these formats have to buy the right licence. Some formats are free of IPR, like Ogg Vorbis..

number of times a work may be accessed, the duration of access, the ability to reproduce or transmit the work, or the payment schedule for additional access (Burk, 2004).

Thanks to the DRMs, producers and online distributors can propose an online paying offer supposed to replace the illegal and free one on peer-to-peer (P2P) networks. DRMs actually grant to the owners a certain kind of control over their contents, unlike the MP3 format that is used on P2P networks⁵. Thanks to them, the online music market has started to grow in 2004, following the failures of Musicnet and Pressplay, launched by majors in 2001. This is due to Apple, a newcomer in this industry whose platform distribution iTunes Music Store stands out as the leader⁶, also thanks to an access to the catalogues of every major.

1.2 DRMs licences as a strategic stake

DRMs solutions are sold by major firms on the supply side of the market for technical protection of contents. This market was born in the middle of the nineties and is still evolving⁷. Many sellers have disappeared, some have been bought by more powerful firms in every branch. Almost every seller of DRMs solutions has concluded partnerships with huge firms such as Microsoft, Adobe or IBM. Content suppliers are the demanders. Almost none of them is using their own protection system. They rather let more specialized firms cope with it. As a matter of fact, this activity requires huge and constantly renewed investments since these techniques, rapidly obsolescent are never invincible (Doctorow, 2004). Only big firms have the capacity to combine the competences and the financial resources required in this case.

We are witnessing tremendous changes with the meeting of content industries on one hand and digital technologies (data processing, consumer electronics, telecommunication) industries in the other. The latter are globalized and their economic weight is much higher. In 2003, at the worldwide level, cultural industries' (television, press, publishing, movies, radio, recording, video games, content websites) turnover was four times less significant, with 767 billion dollars on the one hand and 2790 on the other (Chantepie, Le Diberder, 2005). A digital convergence is now taking place. Broadband access is now possible with copper cable and the ADSL, cable, satellite or mobile phone. *"the convergence is no longer the merger of markets and professions, rather takes the form of broadband platform that connects heterogeneous terminals to diverse services. The different actors in data processing, telecommunication, EGP and content will now be obliged to go through it"* (Lequeux, Rallet, 2005, p 3, our translation).

Whether specialized or not, digital terminals can now be connected and contents can go from one to another. Henceforth, the domestic digital world has an heart. One has to control this heart as well as the associated standards in order to keep the control of the relation with the customer. Firms in consumer electronics and software program are now competing to become the gatekeepers of the digital distribution, using this relation, the control of access and the protection of contents (Chantepie, Le Diberder, 2005). In this competition, DRMs stand out as a crucial aspect since they are necessary to get an access to the customer. Actually, they make it possible to establish a connection between three worlds (see fig 1) :

- the world of contents (cinema, music, games) and their owners.
- the world of distributors. They have to encode contents and to manage the distribution platform.
- the world of users; hardware manufacturers and jukebox software producers make it possible to store and to read dematerialized musical contents on terminals (such as PCs, mobile phones, TVs, game consoles, ...) available for customers.

The DRMs supplier negotiates on the one hand with hardware manufacturers, whose products are equipped with DRMs and on the other hand with content distributors such as the online music platforms. Some actors, like Napster, deal only with distribution and not with content or terminal production. Others are white label services, that is to say that they take care of distribution on the account of the most famous brands. Thus Loudeye/OD2 works on the account of Amazon or Barnes & Noble and, in France, Virgin Mega deals with its own distribution as well as it works for other brands.

On the other hand, content distributors negotiate with rights owners, the conditions of distribution. So there is seldom direct link between the owners or their representatives and the DRMs suppliers (see fig.2). Sony is the only firm that has chosen vertical integration all along the online distribution chain (content, on line distribution with Sony Connect, DRMs and hardware).

⁵ This is also a reason why this format is so appreciated by the users of P2P networks.

⁶ On the American market, Apple's market share reaches 70%, far beyond Napster (11%), Musicmatch (6%), RealNetworks (6%) and Walmart (6%).

⁷ The market for DRM is hard to assess since most of the transactions are made between firms.

Among all DMRs suppliers, DRMs software publishers are in a favourable position, especially in the field of online music distribution. Four firms are now dominating the market: Apple (AAC format and Fairplay DRMs), Microsoft (WMA format and Windows Media DRMs), Real Networks (Real Audio and Liquid formats and Helix DRMs) and Sony (ATRAC3 format and Open MagicGate DRMs). The online music market is likely to be monopolized (Picker, 2002). And the small number of DRMs providers only worsens the situation. Since these DRMs stand out as a crucial asset in the online distribution value chain, to control the DRMs market amounts to control an huge part of the online music market.

Since DRMs software programs do not belong to open source, they are protected by IPR and distributed through computer licences. A software company does not sell its software programs the way a traditional one does. Instead it makes deals with potential users. A computer licence is a contract between the company and the user that allows this user to use the software program. In return, the user pays royalties and has some obligations. DRMs licences are a model of how a firm can take advantage of its IPR. These powerful tools serve the strategy of software publishers (Muselli, 2004). In our case they stand out as a crucial stake for the software publishers as well as for the entire music industry. This industry is actually changing since the advent of digital technologies (OECD, 2004, p.54). If a firm succeeds in imposing its own DRM system, it will benefit from network externalities linked with the building up of a virtual network made of every content and service compatible with the DRMs (Bomsel and Geffroy, p.9).

2 – Competition between standards and associated risks

The few leading DRMs providers are now competing to impose their own system. The online music market stands as no exception. The coexistence of competing protection projects can be compared to a competition between standards (Farchy, Rochelandet, 2002).

2.1 Firms' strategies in order to impose their standard

Besen and Farrell (1994) analyze the process of standard-setting in the case of a two-firm competition. Three cases may be distinguished:

- in the first one (« Tweedledum and Tweedledee »⁸), every firm tries to impose its own standard;
- in the second one (« the Battle of the Sexes »), both firms agree on the necessity of a unique standard, but each one would like its own to become this unique standard;
- in the third one (« Pesky Little Brother »), one firm tries to keep control of its standard whereas the other tries to join it.

With more than two firms, strategies are becoming more complicated, mixing the features of the three described situations. At first sight, the market for DRMs is very alike the first case: firms are competing in order to impose their own standard. According to Besen and Farrell (1994), firms can use four types of strategies:

- the first one consists in “building an early lead” with as numerous users as possible (customers and/or firms using these DRMs for distribution or for reading), especially in order to benefit from network externalities;
- the second one consists in “attracting the suppliers of complements”;

In both situations, “penetration pricing” towards customers or the other firms stands out as a classical strategy (Katz and Shapiro, 1986).

- the third one consists in “product preannouncements” in order to attract customers and to deter competitors;
- the last one consists in “price commitments”.

More generally, two strategies are possible in a context of technological competition (Shapiro, Varian, 1999) : on the one hand, the firm can decide to close, that is to say to restrain the access to its licences. On the other hand, the firm can decide to open, that is to say to allow as many firms as possible to get an access to its licences so that their products may be interoperable with the one of the firm.

This difference is very striking in the DRMs market. Some firms have decided to restrain the access of the other actors to their licences. That is the case of Apple, which is criticized by other firms on this market. Actually, only Apple's iPods are designed to read songs bought on Apple's iTunes (converted into AAC format and protected by Fairplay DRMs). Conversely, until recently (see infra) iPods could only read music protected by Fairplay or else encoded in MP3. Apple refuses (except under very restrictive conditions⁹) to grant a licence for its DRMs to other music online distributors and portable devices manufacturers. Thus, Apple can not count on the support of firms producing complementary goods. However, it reduces competition for its online music site and its portable device. The risk for Apple is not to succeed in imposing its own standard, just like Sony with the Betamax in the eighties (Bernoff, 2004). Until recently, Sony had followed the same strategy but it has announced in 2005 that it would join the Coral consortium, and then cooperate with competitors (see infra).

Other DRMs software publishers have decided to open their DRMs, in the sense that they allow almost as many licences as possible in order to impose their standard to other firms and then to consumers. This is the case for Microsoft and Real Networks. Microsoft does not sell portable devices and as usual focuses on software publishing. It proposes its DRMs to as many hardware manufacturers (more than 70 portable devices manufacturers) and online distributors (for example Virgin Mega, Movie system, Movielink¹⁰, Napster, Wal-Mart, OD2, AOL,...) as possible. Licences are sold at a very low price, which could be compared to a predatory pricing set up to deter potential competitors, to lock the market and eventually to raise prices once the market

⁸This is a reference to the characters of *Through the Looking-Glass and What Alice Found There*, the sequel written by Lewis Carroll of *Alice in Wonderland*. A nursery rhyme quoted by the author begins with:

“Tweedledum and Tweedledee
Agreed to have a battle...”

⁹ Apple made for example an exception in the case of Hewlett Packard's portable devices.

¹⁰ Now Canal + Active

monopolized. Moreover, the licence may be rather cheap, there are still installation costs. Finally, this DRMs only works with Microsoft's operating system (OS), which obliges the user to buy this OS and not to leave it. Thus, Microsoft's strategy consists in trying to keep the PC, and most of all its OS, as the core of the distribution of content and to make money with it.

Real Networks also tries to impose its DRMs by licensing it to as many firms as possible. But its strategy relies less on low prices and more on interoperability. Actually, unlike Microsoft, Real Networks has no OS to promote. It has then decided to make its DRMs compatible with other OS such as Linux. Real Networks' strategy is confirmed by the launch during summer 2004 of the technology named "Harmony". Actually, it enables the music downloaded from RealNetworks Music Store to be read on portable devices and jukeboxes initially only compatible Apple's and Microsoft's DRMs. That is to say that a song downloaded from this site can henceforth be read on a iPod.

This is the third case for Besen and Farrell (1994), "Pesky little brother". Apple, and to a far lesser extent Microsoft, tries to impose its own standard without seeking an agreement with its competitors. On the other hand, Real Networks tries to avoid a competition between standards by assuring compatibility. This kind of competition is more likely to happen in the case of asymmetric firms, which seems to be the case here. According to Besen and Farrell, for the firm who wants to avoid compatibility the solution is either legal or technological. Apple does not seem to have the intent to sue its competitor by claiming that its IPR have been violated. Rather, it tries to renew enough often its technology. Thus, in December, iTunes and iPods were updated and the reading on an iPod of music bought on RealNetworks Music Store became impossible. This may only be the beginning of a race between these firms.

The common point of Apple (closed strategy) and Microsoft (open strategy) is that they compete on the DRMs market in order to get a dominant position for a compatible product, the OS for Microsoft, the portable device for Apple. And music is here to bring customers to buy iPods or to keep using Windows.

The conflict between standards is not unavoidable. It results from the strategies of actors that want to benefit from "architectural franchise" (Ferguson and Morris, 1993), that is to say a technology that has become an established standard. Such a conflict does not exist in the P2P networks. In these networks, contents are encoded in more open formats such as MP3, Divx, Mpeg4. Such formats are furthermore used outside these networks. For example, most portable devices read MP3¹¹, which seems normal since most users use this format and its licence is easily available. This is less obvious for online distributors that want to control the distribution of the content¹². MP3 does not enable them to do so because no DRMs can be associated to it. Some distributors such as MP3tunes or emusic.com use it anyway because of its large compatibility and openness, that are greatly valued by customers.

2.2 Potential dangers

The possible abuses of dominant position and the issue of essential facilities

To get a DRMs licence can become the source of conflict between online distributors and DRMs suppliers. Thus, in France, the online distributor Virgin Mega raised a complaint against Apple in 2004. The reason was that Virgin Mega could not get a licence to add Fairplay to its platform. This refusal was interpreted by the distributor as an abuse of dominant position on the behalf of Apple that was said to have a dominant position on the markets of digital portable devices and of legal online music distribution.

Actually, Apple does not only supply DRMs, it also competes with Virgin Mega for the online distribution of music and most of all it sells portable devices. Moreover, it is impossible to read with an iPod a song downloaded from Virgin Mega's site because of the lack of interoperability between Virgin Mega DRMs and the iPods DRMs. In fact, Virgin Mega uses Windows Media DRM whereas an iPod can read protected songs only when they are protected by Apple's proprietary DRMs, Fairplay.

The Council of Competition did not decide in favour of Virgin Mega¹³ for many reasons:

¹¹ The devices sold by Sony had stood until recently as one of the few exceptions.

¹² Beyond them, this is a claim of the main owners when licensing their catalogues to online distributors.

¹³ [Décision n° 04-D-54 du 9 novembre 2004, relative à des pratiques mises en œuvre par la société Apple Computer, Inc. dans les secteurs du téléchargement de musique sur Internet et des baladeurs numériques.](#)

- First of all, most of the downloaded music was not read on portable devices but rather used with different aims. Moreover, the iPod's position on the market for portable devices appeared – and still seems – rather fragile. Actually, on the one hand, new portable devices were expected to come fast. These devices were compatible with other DRMs, particularly Microsoft's. On the other hand when including devices without an hard desk, Apple's domination seemed less clear. All these arguments could be summarized in the existence of substitutes.

- Furthermore, it was possible to circumvent DRMs by burning CDs, which is a bit binding but very easy. Thus anyone could transfer songs downloaded from Virgin Mega's site to an iPod.

- At last, nothing proved that iTunes' success was linked to Apple's DRMs.

Considering the jurisprudence and all these arguments, the council decided that the abuse of dominant position was insufficiently characterized. As a conclusion, it seems to our opinion that the existence of Real Networks' "Harmony" (see supra) reinforces the Council's decision.

The issue of essential facilities could also have been evoked in this case. This doctrine is notably used in the EU competition law. According to it, the abuse of dominant position may consist in the fact that a firm controls an installation considered as an essential facility. This installation is either infrastructures, goods or services. It can not be rebuilt again with reasonable means and its access is crucial for the competitors of the dominating firm. More precisely, this firm holds a dominant position when it deals with putting at disposition this installation. Then it abuses of it when it refuses to give an access to competitors without an objective reason. The decision made by the Council of Competition, without making explicit reference to this doctrine indicates that Apple did not have to give to Virgin Mega an access to its DRMs.

Anyway, jurists remain reserved as for the use of the essential facilities' doctrine in the case of IPR (Lipsky and Sidak, 1999, Lucas, ...¹⁴). According to them, new products and new services are not likely to be invested in if the owners of IPR can not keep the control of the granting of licences. That might be why the American antitrust authorities only use this doctrine in very specific cases.

Nowadays, on the market for DRMs it seems as if there is no abuse of dominant position. However, one must keep in mind that DRMs suppliers are in a strong position in the online music distribution supply chain. This could lead them to a dominant position or a monopoly if one standard succeeds. DRMs are already described by their supporters as a handy means. However this means does not always respect existing exceptions to IPR, such as private copying. Moreover, this means is strictly controlled by its owner. Thus, content owners may find Windows Media DRM very practical, they can not choose options that are outside the framework imposed by Microsoft.

Most content suppliers do not any longer produce DRMs. Instead, they have become customers of specialized DRMs suppliers. Thus they may be experiencing moral hazard since they can not assess to which extent the supplier is making an effort to improve the system. At the end, the achievement of one standard could lead to the rising of the price of the licences and the deterrence of competition. The already existing rules that prevent the circumvention of technologies of protection would then reinforce its market power. Unprecedented control over content potentially confers unprecedented market power on the developer of the dominant technical standard, facilitating anti-competitive conduct (Burk, 2004). On the contrary, the succeeding standard might be a more open and interoperable one. This could happen thanks to a public intervention or to strategies led by private actors. Then the content owners might recover their strong position.

Beyond potential future risks of abuses of dominant position what is at stake now is the absence of interoperability between standards.

Uncertainty about interoperability

In short term, competition between technologies is profitable, notably since it spurs innovation on. However, it is generally admitted that one condition of its efficiency in the longer term is that the different systems are interoperable. A whole literature has developed the social benefits resulting from the uniformization of technical standards and on the other hand, the problems caused by the lack of interoperability between standards (see for

¹⁴ According to this author, such an attitude would lead to take as granted the principle that states that the rights owner in dominant position is obliged to help other agents to compete with it.

example Gates, 1998). Interoperability¹⁵ may be defined as “the ability for two or more software programs or systems that have complementary functions to operate together thanks to the use of common standards” (Morvan 1991, p 135, our translation). These systems can then communicate in an unambiguous way, that is to say exchange information and afterwards use it. When there is interoperability, the use of a content is not limited to one type of standard. Three paths may lead to interoperability: either the private agents voluntarily find an agreement and define common standards, or one succeeds individually in imposing its own standard, or a norm is imposed by a public agent.

Interoperability is considered as an essential condition of free competition and most of all diversity of agents even though in some markets, such as video games for instance, it has not seemed necessary. The very existence of different competing and uninteroperable systems seems bad for content producers as well as users. Technical conflicts are likely to happen if the same contents are protected with different systems at different ages of their valorisation. They would be harmful for content producers whose interest is to have their products compatible with any reader or computer. From their point of view, different countries should also make sure that their chosen standards are interoperable. This is because of the global dimension of the distribution of content through the Internet (Hoeren, 1995). All this can explain why in November 2004, in the USA, during the first Digital Entertainment Awards, Rhapsody obtained the “Best Downloadable or Subscription Music Service” and Harmony the “Digital Music Innovation of the Year”¹⁶. Actually content producers have no interest in the existence of uninteroperability.

And so do the consumers. Actually, when there is no common standard, they must choose where they download music from by choosing the right sites protected by the right DRMs according to the device or the jukebox it uses. Instead, consumers would rather choose considering the artist, the composer or the type of music. The coexistence of several DRMs for the same type of contents and without interoperability restrains the choices of the customers, in terms of reader to use or sites to download from. As a matter of fact, the customer will have an access to digital contents according to its equipment and no longer according to its tastes and choices. Moreover, he will always have to juggle with the compatibilities between sites and readers in a constantly evolving market.

Anyway, most DRMs suppliers refuse interoperability, invoking safety risks in case of total interoperability (Burk, 2004), as confirmed by the hearing of these suppliers by the American Congress in April 2005. In so far the states do not seem to have the will to impose one common standard, either firms will agree on minimal common standards or competition will last until one imposes its standards. These are the cases formerly identified as “The Battle of the Sexes” and “Tweedledum and Tweedledee” (Besen and Farrell, 1994).

In order to achieve an agreement on a standard, firms will have to negotiate. Besen and Farrell distinguish several ways of negotiating. For example firms may set up an hybrid standard or let another firm, possibly some kind of joint-venture deal with it, so that any of the firm involved in the agreement is favoured. The latter solution looks like the strategic frame used by the firms that belong to the Marlin Joint Development Association (MJDA)¹⁷. This consortium seeks to produce a DRMs that would compete with the one of Apple and especially of Microsoft. It comes after and seems very linked to the Coral consortium, notably since most members of the two projects are the same. This consortium has aimed at granting interoperability between the DRMs produced by its members¹⁸. Even though appealing, this consortium may not succeed because of the encountered difficulties when it deals with coordinating firms, especially when these firms want to profit from this consortium without ‘losing’ too much knowledge or technical skills¹⁹. Anyway, their achievement might not be better from the producers’, distributors’ and consumers’ point of view. In fact, they could mean higher access costs to technologies. Such costs would be at least partially faced by consumers. Most of all, independent producers or distributors would not be able to bargain with a firm or a consortium that would monopolize the market for DRMs.

Cultural diversity

Numerous analyses on the online music distribution consider DRMs as a crucial technology that enables legal offer to grow and increase the incomes of the recording industry. However, newcomers have a more and more significant place in this industry. Their core business is even farther from music than that of the major

¹⁵ Two systems that are not compatible can be made interoperable. A program is compatible as soon as it can be executed on different environments or systems. Thus compatibility is a component of interoperability.

¹⁶ http://www.reálnetworks.com/company/press/releases/2004/billboard_awards.html.

¹⁷ Sony, Philips, Samsung, Matsushita and Intertrust (a firm that is specialized in DRMs) are members of this consortium.

¹⁸ Both projects are different. On the one hand, the members of Coral consortium elaborate individually DRMs that have to be interoperable/ On the other hand, members of the MJDA are working together to produce a DRMs.

¹⁹ See for example the problems encountered by the SDMI consortium.

companies. This may be dangerous for artistic creation and cultural diversity. Competition policies have paradoxically stood as the last protection in favour of diversity of producers. For example, they have been used twice since 2000 in order to prevent Emi and Warner Music to merge. However, as the Sony-BMG merger may prove, they do not work any longer.

On the Internet there are many ways to get an access to contents. Therefore, numerous economic models may coexist. In the market sector, on the one hand there could be an economy for highly value-added products based on the control of the access. Such an economy would be supported by DRMs. On the other hand, the remaining products would be used as loss leaders in order to sell something else, such as portable devices, soft drink cans, subscriptions to the internet... In both cases, the American and Japanese firms that mainly control the access and the promotion of products will get the most important place on this even more costly market (Chantepie, Farchy, 2005).

Because of the digital technologies, content industries are becoming dependent upon “technological” ones. These technologies were supposed to free the producers and artists from the power of the major companies. They were also supposed to give an access to the whole world. Quite on the contrary, they may reinforce the power of the firms that control DRMs and of some countries. Such a power is then reinforced by the legal rules that aim at protecting those DRMs by prohibiting the circumvention of the technologies that protect contents (Burk, 2004). Such legal rules can be found in the Dmca (Usa) and in the Eucd (Eu). In both cases they more or less correspond to legal rules included in the Wipo Performances and Phonograms Treaty (Chapter IV, art.18). Maybe the need for interoperability, as expressed by the Eucd, might enhance the situation. This interoperability is asked for by the members of the open source community (Esporn, 2004). It might also be crucial for the existence of independent producers or distributors. Moreover, such bottlenecks may be threats to pluralism (Conseil de l’Europe, 2004).

Cultural diversity has to be defended by something else than traditional, sectorial and national legislations. As a matter of fact, there are authorities that deal with the standardization of the technologies that enable to produce, to distribute, to give an access and to control the reproduction of contents. These authorities are from now on acting upon the future of cultural diversity. For example, national legislations are often accused of only taking into account the interests of the owners. But most of the time they are only adaptations of international or regional treaties. Nowadays a convention for cultural diversity is negotiated at the Unesco. This fight in favour of cultural diversity is considered as too innovative and restrictive by some countries, such as the USA. However, considering the context, it may already be a rearguard action. Actually, for the most concerned countries, this convention must tend to the defence of sectorial and national cultural policies whereas in the digital paradigm the cultural industries are immersed in a globalized world where sectorial borders are blurred and being set up again.

References

- Bernoff, J (2004), "Getting on the same sheet of music", Forrester Research, http://news.com.com/Commentary+Getting+on+the+same+sheet+of+music/2030-1069_3-5283947.html
- Besen, S.M., Farrell, J. (1994), "Choosing how to compete: strategies and tactics in standardization", *Journal of Economic Perspectives*, n°8, p.117-131.
- Bomsel, O., Geffroy, A.G (2005), "Economic analysis of digital rights management systems (DRMs)", MediaNet Project Paper.
- Burk, Dan L. (2004), *Legal and Technical Standards in Digital Rights Management Technology*, WP, www.ssrn.com
- Chantepie (2003) – *Mesures techniques de protection des œuvres et DRM – Rapport pour le ministère de la culture et de la communication*
- Chantepie, Farchy, 2005 – *Industries culturelles et numérisation, la grande transformation – Esprit*, forthcoming
- Chantepie, Le Diberder, (2005) – *Révolution numérique et industries culturelles – Repères*, La découverte
- Conseil de l'Europe (2004), *Les concentrations transnationales des médias en Europe*, Division Médias, Direction Générale des Droits de l'Homme
- Doctorow C (2004), *Digital Rights Management*, <http://www.changethis.com/4.DRM>
- Eagles, I. (2000), - Reconciling intellectual property and competition policy in a digitised world -, *Communications & Stratégies*, n°39, 3rd quarter 2000.
- Einhorn M.A, Rosenblatt B (2005) Peer to peer networking and digital rights management, how market tools can solve copyright problems Policy analysis, February, n° 534
- Espem, C (2004) - Interopérabilité : l'Arlésienne du DRM. Le contrôle des usages s'oppose aux fondements du libre - http://www.freescape.eu.org/biblio/article.php3?id_article=173
- Lipsky AB, Sidak JG (1999) Essential facilities *Stanford law review*, vol 51, n°5, May
- Farchy, J., Rochelandet, F. (2002) – La remise en cause du droit d'auteur sur Internet : de l'illusion technologique à l'émergence de barrières à l'entrée – *Revue d'économie industrielle*
- Ferguson, C, Morris, C (1993), *Computer Wars*, New York : Times Books
- Gates, S.P (1998), *Standards, Innovation, and Antitrust : Integrating Innovation concerns into the Analysis of Collaborative Standard Setting*, 47 *EMORE L.J.*
- HOEREN T (1995) "Aspects juridiques du multimédia. Solutions à long terme", contribution au colloque *Aspects juridiques du multimédia et des SIG*, 27/28 octobre 1994, traduit de l'anglais : www2.echo.lu/search97cgi.
- Katz, M.L., and Shapiro, C, - Technology Adoption in the Presence of Network Externalities -, *Journal of Political Economy*, August 1986, 94, 822-41
- Lequeux, F, Rallet A (2005) *The other Internet, building the new markets for online multi media - Working paper*, French draft : Un internet peut en cacher un autre : vers l'avènement des marchés du multimédia en ligne, Réseaux n° 124, juin 2004
- Lucas A, Lucas H.J (2001) – *Traité de la propriété littéraire et artistique – Litec*, Paris
- Meurer M (1997) – Price discrimination, personal use and piracy : copyright protection of digital works – 45, *Buffalo L.Rev.* 845
- Morvan (1991) – *Fondements d'économie industrielle – Economica*, Paris
- Muselli L (2004) – *Les licences informatiques, un instrument stratégique des éditeurs de logiciels – Réseaux*, n° 125
- OECD (2004), *Working Party on the Information Economy, digital broadband content: music*, Paris: OECD.
- Picker RC (2002) *Copyright as entry policy : the case of digital distribution – The antitrust bulletin*, Summer fall, p 423 – 463
- Shapiro C, Varian H.R (1998) – *Information rules, a strategic guide to the network economy – Harvard business school press*