

Trademarks and patents



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Introduction

In this module we will present the legal protection of other types of intangible property: trademarks and patents. In continental legal systems, these are generally referred to as "Industrial Property rights".

First, we will look at how trademark law protects the use of distinctive signs on a general basis, how trademarks are used and protected on the internet, in particular in relation to domain names, and in relation to software.

Second, we will look at patents and how they are used to protect "inventions", and the problematic issue of software patents and their relationship with free software.

1. Trademarks

Trademark law within the European Union consists of both national laws, that are harmonised to a certain degree on the basis of the EU Trademark Directive (First Directive 89/104/EEC of the Council, of 21 December 1988, to Approximate the Laws of the Member States Relating to Trade Marks), and there is also a Community Trademark system that covers all the countries of the Union (Council Regulation (EC) No 40/94 of 20 December 1993 on the Community trade mark and Commission Regulation (EC) No 2868/95 of 13 December 1995 implementing Council Regulation (EC) No 40/94 on the Community trade mark).

Supplementary content

More details at the site of the Office for Harmonization in the Internal Market.

1.1. Trademark basics

A trademark is any sign susceptible of graphic representation serving to distinguish the products or services of one company from those of the others in the market.

Trademarks

Products: software, such as Linux[®], Mozilla[®] Firefox[®] or MSWindows[®]; or hardware, such as Macintosh[®], Hewlett Packard[®], etc.

Services: computer program development services, the Red Hat[®] software support service, IBM[®] consulting and integration services, etc.

The principal function of a trademark is to identify the value of products and the organisations that produce and commercialise them and to distinguish them from others in the market ("distinctiveness" or distinguishing quality of the trademark). A trademark not only protects its owner but also consumers and the proper functioning of the market in general: consumers distinguish products due to the identifying function of a mark, and its association with an organisation. Consequently, the value of the trademark is that acquired in commerce, i.e., that received from the consumers and recognised by the players in the market. Taking advantage of the prestige of another mark and the associated company is therefore prohibited. Ultimately, trademarks seek to avoid the "*risk of confusion*" of products and services in the market, including the "*risk of association*" between companies.

Although the main function of the trademark is to indicate the **business origin** of a computer program, trademark law may offer a basis for the indirect protection of the **product identified**. This would be the case, for instance, in the situations shown below, where the following may be prohibited:

- The modification of a program and its subsequent marketing with the same distinguishing mark.
- The commercialisation of software removing the trademark of the owner that was included with the programs and putting on another (passing off).

A company such as Red Hat can use its trademark to exercise a monopoly over the versions of the free software it distributes. By doing so, it can offer certain guarantees of quality for its versions (for instance, a guarantee that there are no viruses in the Red Hat® Linux Enterprise) and would distinguish its installation and integration tools and support services.

Trademarks may be of **different types**:

- **Denominative** (one or more words).
- **Graphic** or "figurative" (a drawing, letters or figures or combinations thereof).
- **Mixed** (a mixture of words and drawings).
- **Tridimensional** (the form of an object: for instance, the Coca-Cola bottle or the Michelin man).
- **Sounds** (the Nokia sound of a mobile phone).
- Any combination of these.

Trademarks must be **distinctive**. On registering, there are certain absolute and relative grounds for refusing the grant of trademark rights:

- **Absolute grounds**: denominations which are generic or descriptive (i.e. not distinctive), deceptive, consist of official emblems, or are against public policy.
- **Relative grounds**: applications for a mark which is the same or similar to other previously registered (or otherwise valid) marks in respect of the same or similar products. In this case, the registration process enables prior mark holders to object to the registration of the new mark, and this objection can be either negotiated or appealed by the parties.

Trademark protection is granted in respect of **certain categories of products and services**, as indicated in the application documents for registered trademarks or as claimed, in relation to unregistered trademarks in the UK/US. There is a classification of products that has been agreed at an international level (the *Nice Classification*¹).

⁽¹⁾The Nice Convention for the international classification of products and services for trademark purpose seeks to provide information on trademarks at a national and international level, so that the signatory countries use a sole classification for administrative purposes in the trademarks filed at their registries.

The most common classes for software are 9 (for software as a product), 42 (for software services) and 45 (software licensing). Business services on the internet, such as e-commerce, can fall under the classes 35 (a catch-all for business in general) or 38 (telecommunications services), though it is often more relevant to apply for the classes of the products that are actually sold online (books, software, holidays, etc.).

Therefore trademark legislation tends to allow two identical marks to exist simultaneously if they apply to different products or services, in order not to exhaust usable words (the Nice classification referred to above is important for these purposes). In this sense, the "IBM" trademark for programming services is not the same as it would be for dairy foods, if this existed. Precisely, in order

Supplementary content

Normally, the trademarks associated with a computer program would be denominative, graphic/figurative or mixed, as they are to be visualised on screen.

Supplementary content

Worldwide, laws tend to prohibit the registration of **generic marks** (such as the trademark "Software") and **geographical names** (with the exception of appellations of origin, which have a very specific regime).

Supplementary content

The European Community trademark registration process allows applying for up to three classes for the same price.

that a distinguishing mark not be limited to a single series of products or services, it is advisable, in the case of doubt, to include a greater number of product classes, although this would imply greater costs in fees and procedures.

Trademark rights are **territorial**. As with patents and as opposed to author's rights, legislation tends to establish that a trademark must be registered at the relevant trademark offices in a given territory to be able to claim exclusive rights, and it is necessary to pay a series of administrative fees for it to be effective over time. Unregistered trademark rights may arise in certain jurisdictions through use, such as the UK and the USA.

1.2. Duration and exclusive rights

The duration of a registered trademark is usually **ten years from registration**, notwithstanding its renovation in subsequent ten-year blocks, which may be done indefinitely provided fees are paid and legal requirements are met. Nonetheless, trademarks must in practice be used (under penalty of "lapsing" in case they are not used for five years).

Trademarks grant owners an exclusive right to use a mark to distinguish their products or services in the market with respect to similar products or services of other companies. These exclusive rights authorise the owners to prohibit third parties from marketing similar products or services under the same mark or under a similar mark that could mislead the public.

The trademark owner may therefore prohibit, among other things, the following, without their prior consent:

- Placing the mark on products or their packaging.
- Offering products, marketing them or storing them for such purposes, or offering or providing services under the mark.
- Importing or exporting products with the mark.
- Using the mark on commercial documents and in advertising.
- Using the mark in communication networks and as a domain name.
- Placing the mark on wrappers, packaging, labels or other means of identification or decoration of the product or service, or manufacturing or providing these wrappers, etc. that may be used to perform any acts prohibited in accordance with the preceding points.
- Removing the mark (although they cannot prevent them from adding their own distinguishing marks or signs separately, as long as doing so does not undermine the distinguishing capacity of the main trademark).

Nonetheless, third parties may use, without the consent of the owner of a mark provided it is done "in good faith" and does not constitute "use as a trademark":

- Their full name and address.
- Indications relating to the type, quality, amount, use, value, geographical source, time of production of the product or service rendered, or other characteristics.
- A third party trademark, if the purpose is to indicate the use with respect to a product or service, especially in the case of accessories or loose parts, provided such use conforms to fair industrial or commercial practices.

As with patents and author's rights, trademarks are also subject to the concept of **exhaustion of rights** for products marketed in the territory where the trademark has been registered. In other words, when a product identified with a trademark is sold, the owner cannot demand its return based on a monopoly of the trademark or prevent it being resold (e.g. in second hand markets).

1.3. Acquisition of trademarks

In some countries, the rights granted by the trademark are acquired through registration, with certain exceptions relating to well-known trademarks (trademarks known in the relevant sector of the public to which the products or services are directed) and renowned trademarks (trademarks known by the public in general).

In other countries, on the other hand (for instance, in English-speaking countries), trademarks can be acquired with use; registration itself is a mere formality with evidentiary and documentary effects.

As trademarks are territorial, various types of trademark may be obtained: national trademark, international application or community trademark.

1.3.1. National trademarks

Every country has its own trademark office (except the countries of the Benelux, which share a common office) and it is necessary to submit trademark applications separately in each office for the protection of the trademark in that country. This usually requires some simple formal requirements to be met, and the payment of an administrative fee (application fee, concession fee, renewal fee, etc.).

The application procedure varies depending on the trademark office of each country. Basically, they try to filter out applications that do not meet the requirements established by law. The process starts with the filing of documents, followed by the publication of the application in the relevant trademark bulletin. Later, a term for objections commences and, finally, the trademark is either granted or denied.

Supplementary content

It would be fair to use the Linux[®] trademark to say that a product is "built to run on the GNU/Linux operating system" as this is merely descriptive of the product, and not used to commercialise the GNU/Linux system.

Supplementary content

Marks are often identified by the [®] sign when registered and the [™] sign when unregistered.

Trademark rights arise from the date of application for the mark, and a trademark applicant is also entitled, when requesting the same trademark in other countries signatories of the Paris Convention, to ask for "international priority", going back to the date of original grant in the first territory. International priority is given for a period of six months, and is not subject to extension.

1.3.2. International applications

Internationalisation of a mark country by country is expensive and complicated (it implies following a separate procedure for each country). Therefore, in 1891 the Madrid Convention was executed in relation to the international registration of trademarks.

An international application is an international administrative cooperation system directed to simplifying the steps required to register a trademark simultaneously in several countries. Such a process is less expensive than separate and individualised processes in each country.

The process is managed in Switzerland by the World Intellectual Property Organization (WIPO), a special agency of the United Nations. The procedure starts from an existing registered trademark or application (national, community, etc.) and extends its effects to other countries (allowing requests to protect the mark in several countries at the same time) through a single document: the international application.

The result is a "collection of title deeds" to a trademark that are individual and independent.

Fees in relation to the international process vary from one country to another. The fees would be added for each designated country. This amount would always be less than the corresponding number of separate applications.

The inconvenience with this system is that, during a period of five years from the date of registration, an international registration depends on the original trademark registered or applied for in the country of origin. And if the application is denied or if the base registration ceases to be effective (either by cancellation or as a result of decision by the original office or court order, or due to voluntary cancellation or failure to renew), the international registration would no longer be protected during such five-year period and may be cancelled.

After the five-year term, the international registration loses all dependency in respect of the base registration or base application and each territorial trademark right is a separate right.

1.3.3. Community trademark

The international administrative cooperation procedure was not thought sufficient for the efficient operation of the European Union and the internal market.

Consequently, Regulation (CE) 40/94 by the Council, of 20 December 1993, regarding the community trademark, establishes the possibility of applying for a **community trademark** (often called "CTM"), either directly with the *Office of Harmonization for the Internal Market* (OHIM, in Alicante, Spain), or through the respective trademark offices of the EU member states (to be forwarded subsequently to OHIM).

The result is a single certificate that is valid simultaneously throughout the entire territory of the European Union. Fees are greater than those for a national trademark, but less than the sum of all of them.

The setback with this system is that, if the trademark is denied in a country based on a prior national trademark, the application fees would be lost and it would be necessary to start again to request another different trademark or request the relevant remaining national trademarks in which there are no equal or similar precedents.

Procedure

The procedure of examination of a CTM application may be schematically summarised in the following seven stages:

- 1) Presentation of application.
- 2) Preliminary examination and agreement on presentation date.
- 3) Examination of other formalities (fees, classification, priority, aging, etc.).
- 4) Search for precedents.
- 5) Examination of absolute grounds for denial.
- 6) Public announcement of application and period for opposition.
- 7) Issue of certificate and registration with community trademarks registry.

Of course, the risk of denial of grant is higher because the holders of any prior identical or confusingly similar trademark registered or recognised in any of the EU states can object to the CTM application.

1.4. Trademark assignment and licensing

Trademarks may be "sold" (or **assigned**, as we say) to others, like other property, so that the recipient becomes the new holder of the trademark rights. This happens, for example, when a company sells off a business division to another, together with the trademarks associated to the products (and production line) that are sold to the buyer.

Trademark transmission may be carried out separately from that of a company (this is the case of most EU national trademarks or the community trademark). Nonetheless, in some

countries, the default rule may be the opposite: trademarks may only be transmitted along with the corporate structure, what is known as assignment in gross.

However, in order to enable a third party to use a trademark (e.g. a retailer or reseller of your goods), it is more often the case that rights to use the trademark are **licensed**, subject to controls of product quality and use of the mark. Indeed, it is an obligation of the trademark owner to "police" the use of his/her trademark in the market, to protect it against dilution by third parties (use of the mark by third parties that reduces the identifying function of the mark). So trademark licences tend to establish strict conditions on how the mark is used, with termination of the licence in the event of breach.

Think of the use of the Linux[®] trademark in distributions of intermediaries such as Red Hat, Suse, Mandriva, Knoppix, etc. in the use of "OSI Certified" for a licence or the use of the "Apache" trademark on web-servers, etc. This type of use requires a licence.

Licences may be:

- For all or some of the products or services for which the trademark is registered.
- For all or part of the trademark territory.
- Exclusive or nonexclusive.

Both assignments and licenses may be registered before the trademark offices, so as to provide notice to third parties of the rights that have been granted. For the registration of the respective licence with the trademarks office to be effective with regard to third parties, it must be submitted in writing, to access such public registry. Annotations may also be made there in respect of trademarks, successions, estates, etc.

In relation to free software, as it is distributed worldwide without a formal licensing process (for most free software packages), free software projects tend to publish a trademark policy to regulate the use of the associated trademark, without it being necessary to request a particular authorisation.

Other projects include trademark-related agreements in the licence itself (for instance, in the Academic Free License, or the prohibition of using the trademark "Apache" in the Apache 1.1 licence).

1.5. Trademark infringement

In the event of infringing use of someone's trademark, as with other intangible (intellectual or industrial) property, the rightsholder may apply to the courts for an injunction to cease using the mark and account for profits made by the infringer. In addition, to support the case and conserve evidence, goods exhibiting the mark and other evidence of the misuse may be seized, and bank accounts of the infringing party may be frozen.

Supplementary content

See FOSS project trademark policies such as Mozilla; os-Commerce and MySQL.

Before applying to the courts, the trademark holder should and usually does send a letter to the infringer, often called a "cease and desist" letter, requesting the infringer to do just that: cease the current infringing use of the mark and desist from any future infringing use.

We have commented, in section 9.4 of Module 2 on authors' rights/copyright, on the European framework for protecting these rights, which are applicable to all forms of "intellectual property rights", including copyright, patents and trademarks.

We have already seen above the list of exclusive rights of the trademark holder, and unauthorised use of the mark by a third party in relation to these acts would constitute infringement. However, it is not always clear what is considered "infringing use". To analyse any infringement through the use of another mark that is the same or "confusingly similar" to a protected mark, and the likelihood of confusion, different criteria are usually taken into account, including the similarity in the overall impression created by the two marks (the marks' words/letters, the graphic impression or look, phonetic similarities, and underlying meanings) and the similarity/ies of the goods and services in question.

Other criteria that are considered include:

- The strength of the plaintiff's mark, including its distinctiveness and notoriety.
- Evidence of actual confusion by consumers.
- The intent of the alleged infringer in using the potentially infringing mark.
- The degree of knowledge of the user/consumer and care likely to be exercised by the consumer in choosing a product.

On the other hand, certain jurisdictions such as the UK and the US have established protection for users against inappropriate and unfounded allegations of trademark misuse (e.g. making unwarranted threats, such as sending a cease and desist letter in cases where the use is legitimate).

1.6. Trademarks and internet

Internet and new technologies in general have given rise to a whole new series of questions in relation to trademarks. In this section, we focus briefly on a specific issue in relation to trademarks, which is their use and protection online.

1.6.1. Use of trademarks on websites

Use of a trademark on a website generally constitutes "use in commerce". The owner or licensee of a trademark would usually use the mark on a website for advertising an identified product or services relating to the product.

Use on website that has no economic nature may escape trademark prohibitions, however because it is not always clear when a site has economic implications or not (side banners, self promotion, etc.), this issue should be treated with care.

In certain cases use will be purely descriptive (or "nominative") – basically when the mark is used for identifying a product – and is permitted (e.g., "*I use XXXX products*" or "*XXX products are useful for YYY*"). However there is a fine line between a permitted descriptive use and "use as a trademark" for promoting either one's own products or services or those of the trademark owner.

A use which is not always clear is stating that a person or company has skills and experience in certain technologies or has carried out certain projects using determined products – depending on how this is done, this could be seen as unfairly using the mark to promote the consultant's services.

Unauthorised use on a website would infringe the rightsholder's rights, entitling him/her to request the website owner to cease (and desist) use of the mark, and, if economic gains had been made, a percentage of the profits made by misuse of the protected mark, as we have mentioned above.

One particular issue here is that of territory: the internet has no boundaries, while trademark protection is territorial. So a person could use a sign that is not protected in his/her territory (or for which he/she has protected rights in that territory) but that site is accessible all round the world. So if another person has rights in the same mark in another territory, he or she may claim that the website use is infringing those rights in that territory. This has given rise to a significant number of conflicts between trademarks on the internet, some of which are resolved amicably, while others have given rise to legal procedures, complicated by the issue of determining applicable law and competent courts for deciding on the issue.

While this is not the place to enter into this topic in detail, we note that a certain amount of case law and practical recommendations² have arisen in respect of these cases.

⁽²⁾In particular, WIPO has offered a "Joint recommendation concerning provisions on the protection of marks, and other industrial property rights in signs, on the internet" which can be found at the WIPO site. It intends to facilitate:

- "Determining whether, under the applicable law, use of a sign on the internet has contributed to the acquisition, maintenance or infringement of a mark or other industrial property right in the sign, or whether such use constitutes an act of unfair competition.

Supplementary content

Typical website trademark usage includes:

- in the domain name (see below),
- in advertisements on the website,
- in hyperlinks,
- in metatags and other (invisible) metadata and
- in adwords and similar advertising programs.

Example

The use of a trademark in a personal blog, provided it was not advertising that or any other product (e.g. it is used to describe or identify a product), would not infringe the rightsholder's rights.

Supplementary content

Chillingeffects.org maintains a public list of "cease and desist letters" brought to its attention. You can see an example at chillingeffects.org.

- Enabling owners of conflicting rights in identical or similar signs to use these signs concurrently on the internet.
- Determining remedies."

Particular points or criteria that courts tend to take into account are whether the sites have a commercial interest and activity, the interactivity of the website (online sales, mere advertising), the use of language, currencies and other localisation factors that could indicate that the website is "aiming" at users within the protected territory.

1.6.2. Use of trademarks in domain names

Domain names are seen as a new form of intangible "industrial" property, inasmuch as they have a specific economic and social value, and can be traded. As a means for identifying the "place" where to find a company or its products online, a domain name acquires quasi "trademark" value for that company.

This is not the place to review the governance and other regulatory issues related to domain names, the role of ICANN and national registries, and their policies as to domain name management. We do, however, want to focus briefly on the relationship between trademarks and domain names.

Insofar as a domain name incorporates a protected trademark, we find a conflict between the owner of the domain name and the trademark holder. Obviously, in most cases these are the same person, as companies buy the domain name corresponding to their company or product mark (*Cocacola.com*, *sun.com*, *IBM.com*, etc.). However, this is not always the case: third parties register domain names using others' trademarks³, either to take commercial advantage or to criticise, or for many other purposes.

⁽³⁾This led to "cybsquatting", "typosquatting", and other forms of use of third party marks, some legitimate, some not.

In another scenario, persons with the same trademark in different jurisdictions came head to head when looking for an online identity.

As the domain name system is quasi-privately run by ICANN, it took a while for national and international bodies to come up with a process for sorting out domain name conflicts. Today, this is generally dealt with by "*Dispute Resolution Procedures*" – either at international level under WIPO sponsored rules (the *Uniform Domain Name Dispute Resolution Policy* or "UDRP"⁴) for generic domain names (.com; .org, .net; .biz...) or nationally in respect of top level country domains (.de, .fr .es, etc.).

⁽⁴⁾"The Uniform Domain Name Dispute Resolution Policy (the UDRP Policy) sets out the legal framework for the resolution of disputes between a domain name registrant and a third party (i.e., a party other than the registrar) over the abusive registration and use of an internet domain name in the generic top level domains".

These DRPs set up a process for an (independent) panel to determine if someone is using a domain in breach of – generally – a trademark holder's rights. They are often based on the WIPO UDRP, which sets three criteria for determining illegitimate registration (and thus order the infringer to transfer the domain name to the complainant):

- the domain name registered by the domain name registrant is identical or confusingly similar to a trademark or service mark in which the complainant (the person or entity bringing the complaint) has rights; and
- the domain name registrant has no rights or legitimate interests in respect of the domain name in question; and
- the domain name has been registered and is being used in bad faith.

This has led to a large number of requests to "recover" domain names registered by third parties, and a significant number of decisions on the merits of each case (), by a panel of one to three arbitrators. These decisions are not without criticism from the legal and business community, often for being too "trademark-holder friendly", despite being, on the most part, practical and commonsensical.

In certain cases, the registration of the domain name has been upheld, even if it uses a third party mark, primarily because the registrant has a bone fide purpose to use the domain name (e.g. for criticism and/or parody) or because he or she has a separate but valid right to use the mark.

The arbitrators' decision is subject to appeal, in the courts of competent jurisdiction (not always easy to determine) so as to provide an appropriate right of legal defence (i.e. before the courts).

2. Patents

Module 2 of this course, on Authors' Rights, indicated that authors' rights or copyright protect the manifestation or "formal expression" of a work, for instance a computer program. They do not protect the concept or "ideas" behind the work – e.g. the algorithms of the software – which are separate from its expression.

A patent, on the other hand, is said to protect the "idea" in and of itself, being a technical solution that is independent from the "manner" in which the idea may be implemented. In other words, a patent –an exclusive right to use an invention– grants a monopoly over an abstract thought or idea, not the concrete "expression" of the "idea".

In fact, this statement is slightly exaggerated, as a patent really protects a (technical) solution to a (technical) problem – i.e. the so-called "idea" in fact must have a degree of applicability and implementation, and not just be purely abstract ("anti-gravity flying machine"). In more general terms, the patent protects technical contributions –inventive ideas– enriching the possibilities of persons in the domain of natural forces, for the satisfaction of their social needs.

This section describes the basic tenets of patent law, before we go on to comment on its applicability to software and the controversy of software patentability.

2.1. Concept and scope of patents

In general terms, it may be said that patent rights are monopoly rights over the exploitation of implementations of the patented invention, granted to the person (inventor) who has created an "*invention*" from which an "*industrial benefit*" may be obtained. The rights are subject to limitation in terms of territory and time.

The rights granted to the inventor are enforced by a document, a certificate requested by the inventor and granted by the state, known as a "*patent*".

Patents require registration: the monopoly rights solely exist upon application for a patent, and clearly only if this is ultimately granted by the relevant patent office. Ideas that are not registered by their creators before being disclosed to the public are not protected by law.

This is a significant difference in respect of author's rights or copyright, which grant direct and automatic protection to the corresponding work, recognised throughout the world, simply upon creation, thus without any registration being necessary (although in

some cases it is convenient, as mentioned in the preceding chapter, to register author's rights or the copyright to provide evidence of the date of creation of the work and a presumption of authorship).

In general terms, therefore, a patent sets out the contractual relation existing between the inventor and the state, whereupon the state grants the inventor exclusive exploitation rights with respect to the invention, normally for a period of twenty years, during which the latter may obtain return on the investment made to produce the invention and profits to compensate the risk assumed.

In exchange for these rights, the state publically discloses the invention so as to enrich the technological patrimony of the country and compels the inventor to exploit it under certain conditions, to guarantee that the patented technology should actually be used.

Anyone interested in the patented technology would probably consider it more convenient to obtain a licence from the inventor in exchange for levies or royalties (i.e., an economic compensation for the owner) rather than risk infringing the patent and pay fines and penalties. This compensation would be not only to pay for the patent itself, but also for the additional know-how not described in the patent documents (necessary to implement the patent) and for the certain technical assistance.

The intention behind the concept of patent is to encourage the disclosure of inventions to society. Patents are not just about rewarding inventors but also for encouraging them not to keep their inventions secret. Without this legal protection, the inventor would tend to keep the invention secret, not disclosing anything about it other than its results (i.e., the products it would place on the market), and thus preventing others from building on this idea to create better products and services.

As applied to software, this would imply that a software patent would need to disclose publicly the idea and means for implementing a given algorithm, including eventually its source code. However, software source code or algorithms tend not to be published in the description of the patent, precisely to maintain the secrecy of the most valuable part of computer programs: their source code.

The disclosure of the invention, although required to be in sufficient detail to allow an average expert in the matter to understand and implement it (one talks of "teachings" of a patent), does not imply that it should make it easy to abuse or avoid the patent, inasmuch as to enable its correct and proper exploitation (under licence).

In view of the wide scope of the patent rights, to avoid the protection of obvious inventions that do not imply any inventive activity, a series of (minimum) legal requirements have been established. The more trivial an invention protected by a patent is, the more detrimental it would be for the state to grant a monopoly on its exploitation. In such case, the owner of the patent would be granted an unwarranted monopoly. It is therefore necessary for government (the respective patent office) to verify and evaluate the patent application requested by the inventor before its concession.

The decision to protect an invention with a patent involves a calculation of costs and benefits as obtaining a patent involves substantial costs (upwards of 10,000-15,000 Euros in certain cases) and, once it has been obtained, annual payments must be made to the respective patents office to maintain effective the rights to the respective patent registration.

As with trademarks, patent law is national and protection is territorial. In Europe (but not within the scope of European Union law) there is an international treaty called the European Patent Convention of 1973 ("EPC") which regulates the granting of what is generally known as a "European Patent". The European Patent is regulated and managed by the European Patent Office, in Munich, which evaluates and grants European Patents. Once granted, these are in practice a portfolio of national patents and invalidity procedures must be taken before national courts.

2.2. Requirements for patentability: inventions

A patent protects "inventions". But modern legislations tend not to define the term "invention": they merely establish that inventions meeting all formal and material requirements are patentable. The definition of invention is therefore vague.

In the United States, an invention must be "new", "non obvious" and "useful". In Europe, on the other hand, an invention must be "new", involve an "inventive step" and have "industrial application". The European Patents Office has in practice developed the concept of "industrial application" as it has understood invention to be a technical solution to a technical problem.

Patent protection thus requires an element of "creativity" (similar to copyrights), in terms of "inventive novelty" defined as a technological advance over prior knowledge. Therefore, what is actually protected – the invention, so to speak – is the technical or technological improvement of a state of knowledge.

2.2.1. Patent requirements

For an invention to be granted patent rights, it must meet the following requirements, which are common to most legislation:

- **Novelty.** An invention is novel when not included in the "state of the art" on the date of application. The state of the art is represented by all that which has been disclosed to the public before the date of presentation of the patent application, on a worldwide basis (i.e. in the country where it is requested or abroad), by written or oral description, by use or by any other means.

Only "prior art" or disclosed knowledge at the date of the patent application destroys novelty, including, with certain exceptions in some countries, the mere local publication in a tiny college in any country around the world, even a few minutes earlier, or the disclosure in the press by the inventor the previous day. Some countries afford a "grace period" to avoid inventors from being deprived of their inventions when they are made public shortly after applying for a patent, normally to test the attractiveness that the invention may have on the market. But that is always the exception.

- **Inventive step.** An invention implies an "inventive step" when it is not obvious, on the basis of the closest prior art, for an "expert" in the matter. Such expert must have an average education in the sector of the invention and have average knowledge and qualities. He or she doesn't have to be Einstein...
- **Industrial nature.** Finally, and as final substantive patent requirement, an invention is deemed susceptible of "industrial application" when its object may be manufactured or used in any type of industry, including agriculture and, potentially, services.

An important difference lies in that, in the United States, inventions are not legally required to have an industrial application or imply a "technical contribution" or have a "technical effect", as we shall later see. Along these lines, the case law of the United States has admitted that inventions may be patented to the extent that they have **specific, useful and tangible results**.

2.2.2. Exceptions to patentability

In Europe there are a series of exceptions or scenarios of non patentability, limiting what may be patented ("*patentable subject matter*"). The most important exceptions are:

- Scientific discoveries and mathematical methods (to the extent that they are all already existent or could not be considered susceptible of industrial use).
- Literary or artistic works or any other aesthetic creation, such as scientific works, plans, rules and methods of performing intellectual activities, for games or commercial-economic activities, and **computer programs** and means of presenting information (to the extent that they are already protected by intellectual property).
- Inventions whose publication or exploitation is contrary to public policy or good customs.

As regards software, the exception (which does not exist in the United States or Japan, but does in Europe) *stricto sensu* is to the extent that the program is considered on its own ("software as such"), but not as a whole and combined with the hardware. In section 3, we will delve further into this matter and will discuss the requirements for the potential patentability of the software implemented on a computer (i.e., in combination with the hardware).

2.2.3. Classes of patents

The invention must always indicate what a given matter or energy should be, or how it should be acted upon to achieve the desired result. In this sense, we may speak of:

- **Product inventions.** These show how a given matter or energy (a machine, for instance) can be.
- **Procedural inventions or methods.** These show how the activity should be in relation to material reality, i.e. how a person should act in respect thereof.

To the extent that a procedure is patentable when performed by a technical production procedure (a computer, a computer network or device directed by running a program), we would be dealing with "computer-implemented inventions, claimed as procedural patents".

Examples are seen in the patents of Acacia Media Technologies, relating to the transmission and receipt of compressed audio and video files over the internet. For further reading, see Information Week.

Supplementary content

To the extent that it is permitted to patent a programmed computer, a programmed computer network or other programmed device, we would be dealing with "computer-implemented inventions, claimed as product patents", i.e., a programmed device.

2.3. Procedure for obtaining a patent

There are a series of formal steps to be taken in order to obtain a patent.

2.3.1. Examination

A patent application is filed with the patent office corresponding to the country or area in which protection is sought. The office then verifies patentability requirements in accordance with the following possibilities (which tend to vary from one country to another):

- **Formal requirements.** The relevant patent office checks if the formal requirements have been met when the applicant provides the documents established by law and meets the formalities determined by such office.
- **Substantive requirements** (or patentability requirements). The patent office verifies compliance with the requirements of "novelty", "inventive activity" and "industrial nature".

With certain differences between patent legislation in the various countries, in practice, the stage of verification of "substantive patentability" tends to be twofold:

- Examination of "novelty". During this stage, ideas lacking invention are detected quickly and cheaply, and the work of the experts of the relevant patent office is trimmed down. Initially, what is known as a *prior art search* is performed. A valuation follows, also known as a technical examination of the application, ending in the decision of whether or not novelty exists. Those preparing a technical examination are much more qualified than those conducting the search for prior art. The novelty of the inventions is valued on a worldwide scale (leading to the standardisation of formalities between patent offices).

- Examination of "inventive step". During this stage, once it has been determined that the idea is not part of the "state of the art", the office verifies whether it has a certain inventive nature, a creative and personal value, and that it is not the logical result of prior knowledge.

Once the requirements have been verified, the content of the patent document is classified in accordance with the International Patents Classification (resulting from the Strasbourg Convention of 1971), and the application may be published in the relevant official patents bulletin for the formal knowledge of all people. This grants third parties an opportunity to object to the granting of the patent before final concession. At the European Patents Office (EPO), applications are published upon conducting a technical report, i.e., before they are granted by the European Patents Office, extending their publication for some two years as a result of the pleas and observations of third parties. This extends the procedure quite a bit until their concession.

In the United States, patents are only published after they have been granted, making the process for their grant faster (less than twelve months, but currently up to 5 years due to over work), inasmuch as, during the grant process, there are no pleas or observations by third parties. In this sense, the EU national and European procedures are among the slowest due to the increased amount of bureaucracy, without this necessarily improving the quality of the technical examination.

In principle, a patent is invalid when it fails to meet the above requirements. However, only a judge may declare the nullity of a patent (after filing the relevant appeal before the courts).

2.3.2. International standardisation of formalities in patents application

The standardisation of formalities has allowed the signature of a series of international administrative cooperation treaties in relation to patents, the purpose of which is varied:

- Based on a single document ("international application"), several patents may be obtained simultaneously in several countries (for instance, using the European patents procedure under the European Patent Convention⁵, before the European Patents Office). The result is the obtaining of the various certificates of ownership (national) in the countries where protection is specifically requested for the same object.

⁽⁵⁾EPC members: The Convention member states are the following twenty-seven countries: Germany, Austria, Belgium, Bulgaria, Cyprus, Denmark, Spain, Slovakia, Slovenia, Estonia, Finland, France, Greece, the Netherlands, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, Portugal, United Kingdom, Czech Republic, Rumania, Sweden, Switzerland and Turkey.

- To reduce fixed procedural costs, the worldwide search for precedents is solely performed once. This is the purpose of the Patent Cooperation Treaty (PCT⁶), signed in Washington on 19 June 1970. This includes partial regulation of the procedure (the "search" and "examination"), and on-

ly the procedures performed by the larger countries, better equipped with technical human resources, such as the United States, Japan and the European Patents Office are accepted.

⁽⁶⁾As with the Munich Convention, the Washington Treaty does not create an "international patent", but an "international application" offering the possibility of obtaining as many national patents as appellations made to the states encompassed by such treaty.

- Finally, we must stress the promotion (not yet effective) in Europe⁷ of the "community patent", a single certificate for several states, as occurs in the United States for all federal states. In these cases, we are dealing with a true "international patent", and not just an "international application".

⁽⁷⁾The European Union seeks to avoid its current situation in relation to the granting of patents, characterised by simultaneous certificates of national patents which may block imports and exports between territories subject to a different monopoly.

2.3.3. The patent document and "claims"

The fact that the novelty of the inventions is valued at a worldwide level has led to the international homologation of formalities, along with the templates used for the application of the patent, the content of the administrative patent documents and the form of drafting them.

The patent document holds the following elements:

- The **first page** of the patent document tends to be common among all countries and must reflect the relevant information of the inventor and the owner, the title of the invention, the date of "international priority"⁸, nationality, administrative data from the patents office itself and a summary of the invention (up to two hundred words).

The summary has no value with the courts, but it does in the context of the world-scale technical databases containing all inventions registered with the most important patent offices.

⁽⁸⁾International priority is the essential means of cooperation between several countries in matters of industrial property and means that a patent application, when filed by more than one applicant, is afforded priority and chosen above others for being the first to meet all administrative formalities (in other words, it does not suffice to be the first to come up with the idea).

Under the "union priority" of the Paris Convention, the term for exercising international priority, where applicable, is twelve months. Nonetheless, according the Patent Cooperation Treaty, "union priority" can be extended for a term of up to twenty months.

- A **technical description** of the invention or report. This report must describe the invention (the problem and the solution) precisely, clearly and comprehensively, justifying the request for a monopoly. Its function is to help interpret the meaning of the claims and must contain sufficient instructions for an expert in the specific field of the invention to be able to reproduce it without requiring any additional inventive activity.

For computer programs, this would imply providing enough information in respect of the program specification, but without necessarily contributing to the source code. Although the description is the central part of the patent document, it does not determine

the content of the legal monopoly, precisely as the descriptions are long and complex. They are, however, used by the courts to determine, under the "theory of equivalents", for instance, whether there may be equivalents between a patented invention and another claimed to be in violation of a patent.

- **Drawings.** Drawings are complementary of the description of the invention. As with the title and summary, they are not binding on the courts, they merely serve an auxiliary informative function (some patent offices require that drawings always be attached for their publication in the respective official patent bulletins).
- **Claims.** The claims are the core of the patent: the claims are devised to condense the legally-binding content of the patent in a few lines, briefly and concisely. These are the statements whereby the inventor determines which new elements make up the invention. In other words, in each claim, the inventor precisely defines what has been invented, containing only such new aspects and elements as make up the invention.

2.4. Owners, duration and content of the patents

2.4.1. Rightsholders

In principle, the legitimate right to request and obtain a patent is invested in the "inventors" and their successors, who may be individuals or legal persons.

As with author's rights, the various national legislations establish a series of rules for foreigners to be granted legitimate rights, pursuant to the Paris Convention (for instance, when having no residence, or no industrial or commercial establishment in the country). In other cases, reciprocity criteria are also applied.

We would also be speaking of:

- **Co-ownership:** when the invention is made collectively by several persons. In such case, they would all be responsible for obtaining joint patent rights.
- **Individuality:** if, on the other hand, the invention is made by various people, but independently, the patent shall usually correspond to the person filing the application on the earliest date (provided it is ultimately granted).
- **Work inventions:** the patent system is somewhat similar to the copyright system (inventions made within the course of employment belong to the employer) with differences depending on the country:
 - **Inventor employees.** If the purpose of their work contract is precisely inventing (systematic research and professional dedication), the patent will usually belong to the employer. The author of the invention shall generally not be entitled to supplementary compensation,

unless the invention were to exceed the content of the employment contract or relation, or provide outstanding benefit to the employer.

- Normal employees. If a worker makes an invention in relation in the course of his/her normal professional activity at the company and the invention has been influenced predominantly by knowledge acquired within the company or by using means provided by the company, the employer is often entitled to assume ownership of the invention, or at least to a right to its use. In such cases, workers are usually entitled to fair economic compensation.

An employer may also often claim inventions made by workers within one year of the severance of the labour relation.

Some legislations grant inventors a personal right binding them inseparably as *authors* of their inventions (we could speak of a "moral right" of the inventor).

2.4.2. Limitations: time and territory

Duration of the patent. Patents usually have a legal term of twenty years, although in some countries, it is possible to extend them in cases where greater costs and risks are assumed. Normally, patents expire when

- Their twenty-year term lapses.
- They are relinquished by their owners.
- The relevant annuity goes unpaid.
- For lack of use.

Once the protection period has lapsed, the invention is incorporated into the body of technical solutions available to all and may be freely exploited.

Territory. The protection provided by a patent is territorial in nature: protection is only granted in the territory corresponding to the office where the application is filed. The fact that the patent is territorial in nature makes it necessary for inventors to request the concession of patents in all countries in which they wish to protect their invention

2.4.3. Rights granted under the patent

A patent usually grants the right to prevent third parties from performing, without the consent of the owner, the following acts:

- Manufacturing, offering, marketing, using and importing or possession of the subject of the patent.

Supplementary content

The European Patent Convention provides the right of the inventor to be mentioned in such capacity in the patent, in cases in which ownership is transmitted.

- The use of a procedure or the offering of its use when the third party knows or when the circumstances evidence that the use of the procedure is prohibited for lack of consent by the owner.
- The offering, marketing, using or possession for such purposes of the product obtained directly from the patent procedure.
- The delivery or offering to deliver means implementing the patented invention, in relation to an essential element thereof, to persons not authorised to exploit it, when the third party knows or the circumstances make it obvious that such means are suitable to implement the invention and are destined for such purpose (unless the relevant mediums are represented by products that are normally available on the market, provided the third party does not instigate the person to whom such mediums are delivered to commit the acts prohibited under the preceding three items).

Exhaustion of rights

Exhaustion. The owner cannot prevent subsequent acts of exploitation (that it has reserved: marketing, use, etc.) by those acquiring products protected by the patent, licensed by the owner or by a third party with their consent, in a certain territory. This is what is known as the exhaustion of rights, a legal precept that is also applicable to trademarks.

There are three types of exhaustion of rights:

- When the exhaustion of the right refers to a single state, it is known as national exhaustion.
- The future community patent regulated by the Luxembourg Convention provides that once the product has been traded in one of the Member States of the Convention by the owner of the patent or with their consent, the exhaustion of the right extends to the territories party to the referred convention. This is what is known as community exhaustion.
- When the exhaustion refers to the entire world (i.e., all states on all five continents), this is what is known as international exhaustion.

2.5. Transmission and patent licences

As is the case with author's rights, only the prerogatives of the inventor-owner of a monetary nature are susceptible of transmission. Not only patents "already granted" can be transmitted, but also patent applications.

Patents tend to be transmissible by any legal means, specifically by sale, transfer, license (of rights) or contribution to a business. The patent may also be used as collateral in a mortgage.

Transmission

Some legislations impose a series of requirements for the transmission of patents, for instance they must be evidenced in writing and be notified to the Patent Office.

Patents are indivisible, which means that they may not be transmitted (as opposed to licensed) in part. Accordingly, it is impossible to transmit a single claim, or transmit the patent or application for only part of the protected territory.

Licences

Due to the "negative nature" of patent rights with respect to third parties (the right to *prohibit* something), more than acts of "assignment" or "transmission" of rights, it is often said that a patent licence is an agreement by the patent rightsholder not to do something: not to sue for patent infringement. In this manner, the licensee has the benefit of exercising all or some of the rights making up the exclusive patent right safe in the knowledge that the rightsholder will not sue. Accordingly, there are authors that understand that patent licences are not merely an authorisation (as we have seen with author's rights), but a waiver of persecution for infringing the patent.

Patent licences may be:

- For the entire territory or for a partial territory. Often, by default, licences are deemed to extend throughout the entire national territory.
- Exclusive or non exclusive. Except as otherwise agreed, patent licences are usually deemed non exclusive and, when they are exclusive, the licensees are authorised to directly exercise the rights derived from the patent and the licensors cannot grant other licences or even exploit the invention themselves.
- By operation of law. These occur when the owner voluntarily offers the patent via the relevant office so that it may be used by anyone who wishes to do so, as a licensee (this implies the payment of lower annual rates for the patent). Such offer may be withdrawn and is presumed to have been withdrawn when the owner of a patent changes.
- For some or all of the rights making up the right of exclusion (manufacture, commercialisation). Contrary to what we have seen with author's rights, in patents the licensee is presumed to have the right to perform all acts making up the exploitation in all its applications.
- Temporal. Again, as opposed to author's rights, a patent licence is presumed to last the entire term of the patent.
- Compulsory or mandatory. If the owner of a patent refuses to grant a licence voluntarily, in certain exceptional cases a compulsory or mandatory licence may be obtained at the courts or through an administrative organisation (Paris Union Convention). Except with "legitimate excuses" (legal, force majeure, etc.), releasing the owner from such obligation, exploitation of a patent must be sufficient to satisfy market demands.

2.6. Combination patents

What happens if the owner or a third party finds an improvement to the invention? The following can happen:

- The owners of the original patent improve their invention. They may request an annexed deed of ownership, known as a patent of addition. This does not extend the patent in time (twenty years) or space (the territory), but to enlarge its content.
- A third party improves the invention, or a new application of the same object, or develops a new invention in the combination of two products/processes that have already been patented. An independent patent may be requested on the prior original patent or patents. Contrary to "addition", in this case, the patents are always different and independent. Their exploitation takes place through cross licensing, which is granted automatically.
- A third party discovers a new idea in relation to part of the prior patent. A patent would rarely be granted in such cases, but could be when it has enough entity in itself to justify cross licensing.

The impact of "prior" patents is such that large firms find it increasingly necessary to join international patent databases to have access to the following data (by order of priority):

- Verify whether an invention is patented.
- Check for potential patent violations.
- Learn which patents have been requested by the competition (i.e., follow up).
- Obtain market information.
- Stay up to date in respect of technological changes.
- Find a solution to a specific technological problem.

The foregoing is necessary to plan the research itself and, where applicable, to abandon or redirect a project in the event that a third party were to request a patent similar or identical to the invention subject to research and development. Indeed, large computer companies, the developers of proprietary software, constantly resort to cross licensing in the exploitation of their products. IBM, for instance, is the company with the largest number of patents in the world. Far behind is Microsoft, which has had to join the race late, as in its early days, it had relied solely on author's rights and copyright. Being unable to "cross license" patents from the beginning, Microsoft has had to pay out substantial amounts to the respective patent owners, and currently has changed policy in hopes of obtaining a large number of software patents and aggressively joining in the cross licensing game and, ultimately, engaging its competition.

2.7. Differences between author's rights and patents

There are several differences:

Aspirin

Aspirin, for instance, was discovered to have cardiovascular effects, in addition to its analgesic effects. Analgesic aspirin and cardiovascular aspirin could not be traded separately on the market as their consumer is one and the same.

Example

An example would be an engine patented for a thermal oscillation of between X and Y degrees Celsius, if someone were to discover that a 75% fuel savings could be obtained at Z degrees Celsius.

- **Object of protection:** the most important difference is found between the author's rights system and the patents system for the object of protection. While the patents system protects the ideas or new creation with respect to the state of the art, author's rights refer to the embodiment of literary, artistic or scientific creations (i.e. expressed on any medium).

In relation to software, in terms of computer programs, patents would therefore protect the functions, results, operation or sequences of a computer program, its algorithms, while author's rights would protect the form in which the program is expressed (the instructions performing a given function), i.e., the source code and object code.

- **Requirements:** The patent requirement of "invention" is therefore set against copyright requirement for "originality".
- **Timing:** Author's rights arise from the very moment of creation of the work, without requiring a declarative act or certificate, as is the case with patents. Although we have seen that registration is a means of protection for author's rights (for instance, notarisation or registration with an intellectual property registry) it is mainly as proof of authorship or a procedure formality for taking legal action.

The consequence of this is that the protection of author's rights or copyrights is weaker, not only due to the fact that the authorship of the work may be challenged more easily in the case of patents, but also by reason of the rights and actions granted to the owner.

- **Duration:** The duration of author's rights is much longer than that of patents, although in relation to computer programs, in either case it is excessive, due to the short duration that computer programs have in practice.

This means that when the patent is extinguished (normally after twenty years), any third party may exploit a program based on the same ideas expressed differently (i.e., with a different source code) from the program of the owner of the author's rights, which remain in force.

- **Prohibition:** A patent allows the owner to prevent another computer programmer from writing any other source code implementing the same invention (regardless of how differently it is expressed). Author's rights / copyrights do not prevent another computer programmer from writing new code that is similar or entirely different and leads to the same functionalities.

3. The controversy on software patentability

The application of patents to software –"software patentability"– is a disputed matter. Under its system of case law, since 1981 in the United States it has been possible to patent "*anything made by man under the sun*". This may be changing on the basis of the recent "*in re. Bilski*" case (2009), certainly in relation to business method patents implemented in computer programs.

In Europe, however, software "*as such*" is excluded from patentable subject matter under the European Patent Convention and most European national legislations. There has been some discussion in terms of the possibility of requiring that an invention must exert a *controlled use of the forces of nature* to be considered part of a "field of technology" and, therefore, to be patentable. This does not necessarily imply that anything that includes software may not be patentable in Europe, as we shall see below, and this has led to great controversy.

We shall now briefly look into the origins of patent protection of software, to later delve in detail into the current controversy arising in relation to software patents.

3.1. History of the legal protection of software

Until the seventies, because large manufacturers of computer hardware (in which the programs were marketed inseparably –bundled– with the computer) wanted to avoid the public from knowing the interior workings of the technology, business secrets and confidentiality clauses were applied to computer equipment, especially as regards software.

During these early times, as the computer program is converted, during its final stage, into machine code (object program), which is merely the electromagnetic signals acting physically upon the hardware (the computer equipment) and have a new result, obtained on a physical medium, it was considered that they could be subject to protection by the legal precept of patents. It was so construed by United States case law on several occasions.

At the end of the sixties and during the early seventies, the various national lawmakers and international treaties began to reject patent protection of software. Additionally, as of 1968, the United States antitrust legislation conducted a progressive separation of hardware and software, leading to the dismissal at an international level of the possibility of software "in itself" being subject to patents for the following reasons, which are still valid today:

- Legal. Software was not seen to meet the characteristics established for being the "object of protection" under the patent. For such purpose, it is deemed necessary for there to be human work implying the *use of the forces*

of nature to reach a material and concrete result. A program, in itself, is represented by an activity that is purely intellectual, with no direct application to the field of industrial technique

It is generally thought that computer programs do not represent a solution achieving a given result through the use of natural forces, but are of an essentially intellectual content. In other words, they devise possible solutions to a logical and mathematical problem, concreted in the algorithm, manifested in lists of operations (instructions), translated into electrical signals acting upon the computer. Additionally, the ideas contained by the programs are not always, or necessarily, "new", which is a fundamental condition for obtaining a patent. Furthermore, very few computer programs would pass the test of "sufficient inventive activity" (according to WIPO estimates, a scarce 1% would).

- **Bureaucratic.** For an invention to be subject to a patent, it must be obtained after an administrative process that, in many countries, tends to be quite protracted up until its concession. The short practical life of the software implies an important obstacle for its creators and owners, who would solely have their products protected after a considerable period of time as of their applying for the patent.

There is also the fact that the possibility of the programs being protected by patent implied practical difficulties for the respective patent offices and their collapse, inasmuch as one of the aspects accounting for a great part of the work of such offices is the verification of novelty and inventive step. In view of the boom of the computer industry, adding another category of invention for software was not desirable, as patents would be granted even later.

- **Economic.** The procedure for granting a patent is, quite frankly, expensive. Not only due to the expenses implied by the registration of the patent, its renewal and the payment of an annual fee, but also the cost implied by the fees of the professionals (engineers, lawyers, etc.) participating in the matter. This nonetheless does not imply an obstacle for the larger computer companies.
- **Political.** In Europe, there was a true distrust in leaving open the means of protection of software through patents to the United States, as they already dominated the production of hardware.

The situation led to an initial decision at the international level to exclude patent protection of software, considering it inadequate or undesirable. But that only lasted a few decades.

In spite of the first references in United States case law favouring the patentability of computer programs in themselves, the courts in the United States unanimously agreed that a method that may be developed by the human brain (mental steps) cannot be subject to patent. As computer programs do not relate to physical matters and may be developed by the human brain, they were deemed not patentable.

Other countries (as was the case of France in its Patents Law of 1968) established in their laws a clear and outright exclusion of the possibility of protecting a computer program through the legal precept of a patent. In parallel, the case law of other countries also reflected the position assumed by the legislation (among the relevant of these are the French case of Mobil Oil in 1973 and the German case of the Disposition Program of 1976).

Furthermore, the Munich Convention on the European Patent, of 5 October 1973, already examined herein, excluded software from patentability under its Article 52.2⁹.

⁹Specifically, Article 52.2 reads as follows: "Not to be considered inventions for the purposes of paragraph 1, specifically, are: [...] c) plans, principles and methods for the exercise of intellectual activities, for games or for economic activities, and computer programs".

This led to the European countries adopting similar wording in their national legislations.

Spain specifically established, in Article 4.4 c) of the Patents Law of 1986, the following text: "Specifically not to be considered inventions in the sense of the preceding section [defining what is patentable], are plans, rules and methods for the exercise of intellectual activities, for games or for economic-commercial activities, and computer programs".

The position assumed by the aforementioned legal texts has also been reflected in the cases brought before the courts of the various European countries party to the Munich Convention.

In the eighties, the historical debate on whether it was convenient to protect software with patents resurfaced, due to the worldwide pressure of the large United States software development companies (facing the losses that they had already sustained by then due to the pirating of their programs) and their intention to obtain the greatest protection possible for software through the various legal precepts applicable in each case.

The countries sought protection of the software itself, first through specific protection (which failed), and finally through author's rights or copyrights, as we have already discussed in Module 2.

Although the intellectual property legal framework (copyright) does not provide an ideal solution to prevent the unauthorised use of software, it did offer a prompt legal and international response to the desires of the large computer companies. Copyright law was also adapted to limit the possibilities of using reverse engineering (imitation of ideas without copying the code to obtain the same result, modifying or inverting the sentences or logical instructions), which was considered an unfair practice.

3.2. Patentability of software

But are computer programs really "literary" works? What problems are posed by protecting computer programs with author's rights? Creators and owners of computer programs wish to obtain the greatest possible protection for their rights and protection by author's rights does not cover the "ideas" inherent in the computer program (ultimately, the most creative and valuable part of the programs: the algorithm), because author's rights solely limit protection to "the expression".

Besides, we must not forget that computer programs seek a technical result, i.e., they are the technology required to use the computers and are not created to communicate information or thoughts to human beings (which is the ultimate essence of literary works), but rather are designed to communicate with the machines.

So, in spite of it all, the pressure from the large software developing companies on the patent offices led to their granting many patents on computer programs considered in isolation, when, strictly speaking, these should not have been granted. This is occurring not only in the patent offices of the United States, Australia and Japan, but also, more recently, in Europe, where there are more clear legislative limitations relating to the patentability of software.

Although patents on computer programs in themselves are not permitted in Europe, see for example:

- A computer-implemented patent where, in truth, the only thing novel is the computer program itself (See the FFII site).
- A patent of software in itself, granted by the European Patents Office.

In the following sections we shall see the extent to which software patentability is accepted around the world.

3.2.1. Software patentability in Europe

In Europe, computer programs themselves have been excluded by law from the scope of protection by patents. However this exclusion is itself limited.

Munich Convention

Article 52.3 of the Munich Convention itself establishes the following: "The provisions of paragraph 2 shall exclude patentability of the subject-matter or activities referred to in that provision **only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such**".

Therefore, the exclusion of the patentability of the software solely refers to the elements in which the protection of the computer program in itself is claimed: when the computer program is the only element making up the patent application. But it does not exclude industrial procedures implemented with the aid of a computer program.

Thus, the patentability of an entire technical procedure in which a part has been implemented by a computer program seems nonetheless to be accepted. In other words, at present, legislation seems to allow software to be patentable **when it forms part of what is the object of larger technological innovations**. These are referred to as "computer-implemented inventions". Patent protection may not be granted for the computer program itself, but to its combination with other elements of the invention, which has "technical" effects.

This is particularly controversial and difficult to apply.

Drawing the lines

In reality, the European exclusion of the protection of software "as such" through the precept of patents is not so simple. Precisely, the problem lies in where and how to draw the lines of when software is patentable and when it is not. In other words, when is software to be deemed implemented in an invention? When is the exception being abused to achieve the patentability of software that, in truth, does not form part of a patentable invention, but rather is independent from such invention?

- When the item claimed is not the program itself, its presence in the claim is not in itself sufficient grounds to deny patentability, if the claimed item has "technical effects". This means that, for instance, machines and manufacturing or control processes run by a computer program must be considered patentable items.
- A program may be integrated into the computer itself, an electronic appliance or device, so that they become inseparable. Examples of this are seen in the first computers, which already incorporated their operating system, in some modems (those based on digital signal processing devices) or file programmable gate array (FPGA) type hardware. Therefore, in cases where the program is seen as another element of the invention, the patentability of the computer program is, in principle, accepted in Europe.

This is also captured in the case law interpretations reached in the specific cases brought before the judges. In several national cases (for instance, the case of Schlumberger in 1981, France; or the case of Seitenpuffer in 1991, Germany) and before the European Patents Office (Viacom, 1986; IBM, 1997), it was understood, on the one hand, that as most important recent inventions required computer programs, their exclusion from the scope of patentability would imply some ludicrous results in practice. Additionally, it was considered that a claim relating to a technical procedure performed under the control of a program cannot be considered as relating to a computer program "in itself".

In principle, building on the exception established by Article 52.3 of the Munich Convention and based on the TRIPS Agreement, the EPO understood that if the claimed object were to offer a "technical contribution" to the "state of the art", i.e., if it were to have a "technical effect" beyond the interrelation between the program and the computer, its patentability should not be questioned merely for the program being implicit in its implementation.

Under Article 27 of the TRIPS Agreement, adopted by the World Trade Organization in 1994, the following are patentable: "all inventions, whether products or procedures, in all fields of technology, provided they are new, imply an inventive activity and are susceptible of industrial application". And adds that: "[...] for the purposes of this Article, any member may consider that the expressions inventive activity" and "susceptible of industrial application" are respectively synonymous with the expressions "not evident" and "useful".

The foregoing position is confirmed by the Appellate Chamber of the EPO in its successive decisions (which must be taken into consideration in the interpretation of European legislations, but are not necessarily binding). In this sense, due to the pressure from large United States companies, a decision by the Chamber recognised that:

Author citation

"A patent may be granted not only in the case of inventions in which a program manages, through a computer, an industrial process or the operation of part of a machine, but also in cases in which the computer program is the sole medium, or one of the necessary mediums, for obtaining a technical effect within the aforementioned meaning, whereby, for instance, a technical effect of that type is achieved through an internal function of a computer under the influence of such program".

The practice of the European Patents Office has recognised that it is possible to patent software by presenting the application drafted in a certain way. Upon the basis of this it has been said that the European Patents Office has granted over thirty thousand software patents, while the Office itself claims only about 5,000. This situation is not very satisfactory as it produces a great deal of legal insecurity and distorts the market, inasmuch as the practical application of patents regulations is not the same throughout Europe.

US impact

This is mainly attributable to the pressure of the large computer companies of the United States, which have been able to "slip through" many software patents as isolated computer programs and intend to continue to do so, although it be under the guarantees of legal relief. Of the software patents granted by the EPO, 75% belong to United States companies, precisely due to the interest and pressure they have exerted in Europe, compounded by the fact that European companies have not known of the use of patents as a means of protecting their products (or, as applicable, as the European companies that did know, considered patents to be complex, expensive and difficult to apply for small companies).

The Amazon one-click, patented at the United States Patents and Trademarks Office (USPTO), is an example of a software patent converted into an isolated computer program. It is nonetheless necessary to recall that such patent has a "cousin" in Europe, as the patent claims at the European Patents Office differ from those of the USPTO. Having requested its annulment, both in the United States and in Europe, the United States patent was revoked in mid 2007 and the European patent was annulled in November of that same year.

National position

In parallel, the patent offices of some member states of the European Union, such as the UK and Germany (whose legislations also contain the prohibition of patentability of computer programs), have also followed the decisions issued by the Appellate Chamber of the EPO to the extent that the respective

patent offices of such member states of the European Union have granted patents on computer programs that have a "technical effect" or resolve a "technical problem".

Example

The English courts, in particular, have been busy in relation to patents. In the fundamental 2006 *Aerotel/Macrossan* case, the Court of Appeal established a four step test, which changed the UKPTO process for studying computer related patent applications, which seemed to make it more difficult to obtain a software patent (More information about the test on the Intellectual Property Office site). However, with further judicial review in the 2008 *Astron Clinica* decision, the UKPTO changed again its practice (see the IPO site about the decision) and a question has been sent to the EPO widened board of appeal, to reconcile the national and EPO practice.

3.2.2. Patentability of software in the United States and other countries

The United States Patents Law and case law in principle allow the dual protection of software as both "intellectual" property (by copyright) and as "industrial" property (by patent). This is the case both for patents for software, considered in itself, and for computer-implemented inventions.

The United States Patents Office was the first worldwide to accept applications for software patents. Furthermore, the case law of the United States has understood that procedural patents cannot be excluded for all inventions that, in whole or in part, can be implemented with the aid of a computer program.

This position is backed by the case of "Diamond v. Diehr" of 1981, where it was sought not only to patent the algorithm or mathematical formula, but a novel procedure for vulcanising synthetic rubber for moulding, where the intention was not to reserve the use of the known mathematical equation used in the patent: the mathematical formula "forms part of the process as a whole", which is in truth the object of the patent. Since the case of "Diamond v. Diehr", in the United States it was understood that patents extend to the procedure in which the computer programs are involved, provided the procedure upon which the patent application is based is not made up exclusively by an algorithm.

Additionally, as opposed to what we have seen with the doctrine of the EPO Appellate Chamber, in the United States it is not necessary for the patentable invention to offer a "technical contribution" to the "state of the art": it is sufficient for the invention to belong in the "realm of technology" to be patentable. Therefore, the mere fact that an invention uses a computer or computer program is sufficient for it to belong in the "realm of technology", subject to its producing a "tangible, useful and specific result". This further allows the patentability of not only software, but also business methods, which is clearly excluded in Europe.

This has caused terrible chaos at the patents office, which does not have sufficiently trained personnel to quickly analyse the novelty and the inventive step of the programs included in over fifty thousand applications filed per year. As a result, it is claimed that the triviality of some of the software patents granted in the United States is due to a lack of human resources, qualified personnel and searching systems at the relevant patent offices.

In fact, it was not until 1994 that the USPTO hired examiners with degrees in computer sciences. The office tends to dedicate an average of seventeen hours per patent, hardly

enough to consider in detail the patentability of a program. It is for that reason that the granting of a software patent by error is not surprising in this system.

It is now estimated that a patent application takes between 5 and 7 years to process (March 2010).

This has recently been reviewed in the *Bilski* case, which has questioned the practice of granting business method patents, i.e. patents over business methods when implemented in software.

On the one hand, in the United States, the procedure of examination of the patent applied for is not too in-depth or quality-oriented (in the United States there are no stages of comments, opposition, etc.), and this allows for the patent application to be swift and inexpensive, allowing access to small and mid-size industry (contrary to Europe, where the patent application procedure is much more costly). Such ease is defended by the argument that they may later be subject to appeal at the courts and subsequently reviewed or annulled, inasmuch as the mere fact that someone were to find the same idea as that of the patent in the earlier state of the art would invalidate the patent.

It is also necessary to bear in mind that, although not impossible, a search for precedents is quite complicated for software, especially considering that a computer program is represented by mere writing (this is how the instructions given by the program to the machine are to be seen), just as music, mathematics, scientific articles etc. are forms of writing and it is unthinkable that a human being could have absolute knowledge of all literary works written around the world.

In this case, we are dealing with a system of weak patents, where there is a great potential for litigation, which we understand is not convenient for companies that cannot afford it. This also creates insecurity on the financial markets with respect of the value of patents and the portfolios of "industrial property" of the companies.

Patentability of software in other countries: Japan and Australia

The test that the Australian patents office adopts to determine the patentability of the inventions in relation to software is as follows: verify whether an invention implies the production of a "*useful economic or commercial result*". This posture seems even more open than that of the EPO, as it is much more difficult to determine what type of inventions should be excluded, considering that most such inventions have some "commercial application".

The same thing that has already happened in the United States, where some thirty-five thousand software patents are registered every year (even for the software itself), is happening in Japan. In Japan there is a doctrine that has been traditionally construed in a way similar to that of the "*technical contribution*" used by the European Patents Office. In Japan it is considered that an invention must consist of a very advanced creation of technical concepts whereby a natural law is applied.

3.2.3. Failed EU Directive on Computer Implemented Inventions

In the late nineties, the European situation seemed unsustainable for two reasons. On the one hand, there was great uncertainty in terms of the patentability of software, in circumstances in which the Munich Convention excluded it from patent protection, but the EPO allowed the patenting of products containing a computer program under certain conditions ("technical nature" of the product, "novelty" and "inventiveness").

On the other hand, existing European national case law, developed mainly in two member states (Germany and the UK) had adopted differing decisions on important matters relating to the requirements for obtaining a patent (i.e., in relation to the definition of "patentable matter"). This was indicative that, in the absence of standardisation measures, i.e., a Europe-wide law, the courts of the other member states could adopt solutions that were entirely different when ruling on such matters.

The licensees and the public in general, potential users of patentable objects, had no certainty that, in case of litigation, the patents granted in such a situation would be confirmed. In 1999, the European Commission identified the need for legislative action in this regard. Between October and December 2000, it called for a broad public consultation, the results of which evidenced the lack of consensus in respect of the rules that were to govern software patents: should they be restrictive, as they had until then, or should they follow the permissive line of the United States legislation? This led, in February 2002, to the *Proposed Guideline for the Patentability of Computer-Implemented Inventions [COM (2002) 92]*.

The Commission justified the proposed guideline based on the need to seek concerted action in this area to reinforce the competitive position of the European software industry with respect to the United States and Japan, and to avoid their dominance of the market (especially the internet), inasmuch as, otherwise, European companies would be in a position of disadvantage, mainly as regards United States companies, which had already assumed that computer programs were in fact patentable. In principle, the proposed guideline¹⁰ sought to put a stop to European trends of past years, especially those of the European Patents Office, of admitting software patents, and put an end to the legal uncertainty implying erratic case law resolutions within the European Union.

⁽¹⁰⁾As the chapter on the infamous proposed Directive was closed in July 2005, we will only summarise its precepts:

- Standardisation of the various European legislations in this regard and, consequently, of the resolutions that could be issued by the various court orders.
- Mixed protection (complementary) whereby computer programs could be protected by both author's rights and patents.
- Reduction of the large number of trivial patents that had "slipped through" at the European Patents Office and some national patent offices (menial inventions or making insufficient contributions to the state of the art).

- Limited-scope protection, to the extent that the "invention" must make a technical contribution: a computer program applied to a computer (but not a computer program created independently, to the extent that it was protected by author's rights). Along these lines, this would include the software integrated into intelligent home appliances, mobile phones, engine control devices, machine tools, devices of all sorts and complex computer systems.
- Discard the business models or commercial methods of patent protections used in the United States.

Parliament amendments sought to clarify ambiguities in an attempt to define what "computer- implemented inventions" were and what a "technical invention" was. They also attempted to defend "interoperability" to guarantee the use of standards and protocols and access to the information society, defend the "freedom of publication" and avoid the use of the patents system to prevent the dissemination of knowledge and monopolising means of expression, and maintain all legal patentability requirements.

Finally, after a long trip through the European institutions, the bid was rejected by 95% of Parliament in July 2005, the first time this has happened in the history of Parliament; some argued that it allowed for the patentability of any software and others that the amendments proposed did not provide sufficient protection. The current European situation has returned to its earlier uncertainty.

3.3. Advantages and disadvantages of patent protection of software

In this section we shall see the advantages and inconveniences implied by the patent protection of software from the viewpoint of the large computer companies. In the next block of this unit, we shall see the pros and cons of patent protection of software from the viewpoint of free software.

3.3.1. Advantages

Large computer companies are interested in having their software protected by patents for the following reasons:

- Patents protect the "ideas" behind the computer program. Therefore, a third party could be prevented from creating a similar program (even if it were done with a different source code or algorithms) if the computer program implements the same functionalities. Along these lines, the monopoly offered by the patent is much greater than that offered by author's rights and copyrights.
- The employer becomes the owner of a patent in the most direct form. Normally, in terms of patents, the inventions of the workers belong to the employer and the rights in favour of the worker are considerably restricted. Furthermore, any information acquired by the worker from within the company and leading to the invention shall also be the property of the

company, which may assume ownership of the invention or reserve a right to its use.

- In patents law there are no moral rights *per se*. Notwithstanding the possibility that in some patent legislations, the inventor is granted a personal right ("moral right"), in general, with patents, the possibility of the author of the program exercising the specific prerogatives of moral rights (inherent in the author's rights systems) is avoided.
- There is a greater ease of transmission of the exploitation rights to a patent or to grant a licence. This is the case with respect to exclusiveness and the right to grant sub-licences.

"Aggressive" (as opposed to defensive) patents may play an important role in the value of the intangible assets of a company when it comes time to sell. Keeping important aggressive patents also eliminates market competition, although this must be done taking all due care to avoid sanction under antitrust law. Nonetheless, we shall later see how, in the software world, many of the most important companies in the computer industry amass a large number of software patents for "defensive" purposes. To do so, they match the current practice of cross licensing, in compensation of the patents that they breach. In the end, annulling a patent implies time, information and money that many prefer not to spend, especially if they have a strong hand to play.

For SMEs it is very difficult to create a patent portfolio to compete with an industry dominated by a few protagonists that hold the rights to thousands of patents each. Contrary to the intention of a system of patents that seeks to protect the small inventor or innovator, the entrance barrier into the software industry is raised significantly. Even the supposedly simple act of litigating, to avoid payment for an unjustified suit for patent licences, may endanger the existence of companies without the resources necessary due to the high cost it implies.

3.3.2. Disadvantages

But it is not all advantages; large computer companies also see inconveniences in the software being protected as a patent:

- **The period of protection is shorter.** Patents offer protection for twenty years, while author's rights and copyrights provide much longer protection. But this disadvantage is not such considering that, in practice, computer programs are short lived, as they are made obsolete in no time, and the terms established by both patents and author's rights prove extremely long.
- **The cost of obtaining a patent.** Patents imply very high costs in the fees of attorneys and engineers, and fees at the relevant patent offices. Nonetheless, this disadvantage may even prove to be an advantage for large companies in respect of small software developers, as the latter may

not have the necessary resources to cover the costs involved in obtaining a patent.

- **Term for obtaining a patent.** As we have seen, a patent solely grants the rights following a lengthy procedure (which may easily take up to five or seven years, according to the country where patent protection is sought to be obtained), although it is also true that a series of protections are given from the time of the application and the effects are retroactive to the date of the patent application. Nonetheless, the effects and protections shall always be dependent on the final grant of the patent. On the other hand, author's rights protect the computer program from the very time of its creation, without need for any registration whatsoever.
- **Specific purposes.** Software subject to a patent is protected – by the patent – within the intrinsic limits of the patent itself and is not protected if it is used e.g. for purposes or in a manner not claimed in the patent. Under author's rights / copyright, the software is protected against copyright exploitation for any purposes.

3.3.3. Attitudes of the software industry

The foregoing has ultimately led to the following practices:

- Patents are applied mainly for defensive purposes, in other words, to avoid other persons from patenting it, especially to enter the game of cross licence agreements (and exchange their patent exploitation rights with those of other owners).
- Owners refuse to grant licences, as they prefer to exclude their competitors: subject to certain conditions, there is currently no legal obligation to grant a patent.
- Owners sometimes only grant licences on the condition that the licensee:
 - Obtains licences to other patents of the owner.
 - Does not develop products that compete with the patent owner.
 - Pays royalties based on sales, not only for patented products, but also non-patented products.

This would be a substantial problem for free software as it would be difficult to obtain a patent licence, as free software sales tend to be zero and as free software does not control the number of copies distributed (it should be noted that the developers of free software cannot know how many copies there are worldwide, nor do they obtain sufficient economic benefits to pay for unlimited use licences).

- Large companies compensate each other with their large patents portfolios (what are known as cross-licensing agreements to share their large collections of patents). This means that the few companies that may join the game can corner the software market in a particular area, and with

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This would be a great problem for free software, as it competes in several areas of the market, such as operating systems, databases, office environments, etc.

their substantial patent portfolios or funds they can restrict the entrance of new companies into the market. Their philosophy is to patent as much as they can and demand as much as they may from others, to maximise the profits on their extensive patent portfolios, leading to arbitrary raises in the prices of licences.

As a result, large oligopolies accumulate patents and grant each other licences to avoid possible claims for the defensive accumulation of patents.

On the other hand, small companies or individual computer programmers developing free software are barely capable of paying for a patent application and, quite likely, would be infringing upon many of the patents of the large companies. Additionally, large companies with invalid software patents know that, although a defendant may threaten that to have discovered that the idea for the invention already existed in prior art before the patent application (and that accordingly the patent is invalid), this defendant would have no money to start invalidity proceedings and might in any event end up being ruled against in a patent infringement procedure.

It is estimated that seeking to invalidate the patent of Acacia Media Technologies, regarding the transmission and receipt of compressed audio and video over the internet (which could lead to a de facto censorship of the networks), would cost over one million Euros. United States patents USPTO 5132992 and 6144702, and the very similar European patent EP 0566662 (includes Spain).

We thus see that the current practice of obtaining an extensive portfolio of patents is truly justified for obtaining defensive patents and cross-licensing agreements, but not as a means of compensation for the costs invested in guaranteeing the innovation. And the war is not only against the large software developers (such as the powerhouse Microsoft), but also the large hardware producers (as is the case with the giant IBM, the company that controls the largest number of patents granted worldwide, by far). Ultimately, software patents are aggressively used in practice to fight competitors with legal weapons, but not to promote better products.

3.4. Free software and patents

The free software development, distribution and adoption model is quite interesting from a marketing viewpoint: it is a key form of fighting against established monopolies (Linux against Windows, Mozilla against MSIE, OpenOffice against MS Office, Tomcat against WebSphere, Java against the Microsoft development environments) and, for instance, reduce the costs for public institutions which, otherwise, would be completely dependent on the current licences system of the private companies.

Nonetheless, if a software patent system was approved in Europe, or if it was consolidated in the rest of the world and was "applied" in the sense of having software patents (on the "software itself"), the free software world could increasingly face problems. For free software, the protection granted by patents is misused and abused, as we shall see below.

Let us consider the following items in further detail:

- **Visibility of source code.** The publication and public availability of free software source code allows any company with a software patent to easily analyse whether or not the source code used in the free software infringes upon its patent. It is much easier to conduct a patentability study and determine based on the source code the ideas behind the program to see if any of the techniques used in the programs infringes upon a patent. To the extent that the free software will most likely contain thousands of elementary processes, many of which may be patented, it is almost certain that it will unknowingly infringe upon a third-party patent.

The public availability of the source code on which free software is based simplifies the search for patent violations and makes it more vulnerable to possible court suits and even criminal complaints. This vulnerability may determine that the companies using free software prefer not to publish it, so that the patentability of the software distorts the principle of publicity and openness on which free software is based.

To avoid this contradiction, there are those advocating for granting immunity from software patent infringement resulting from the publication of their source code, although exploitation should be conditioned to the limitations of the patent owner and, therefore, subject to the relevant licence.

- **Owners and responsibilities.** The fact that with free software there is not a single company owning all the rights hinders the mechanisms of defence in case of litigation for infringement of other patents, cross-licences or the payment of royalties. Additionally, the decentralised construction of free software (through many contributions) complicates the establishment of the responsibilities of each developer in the chain and the evaluation of the legal risks of the various contributions. Below we shall comment on the treatment of patents under free software licences.
- **Protection of "ideas".** Granting a patent on software could be dangerous for future developments, as what would be patented are often merely "ideas". Some ideas (algorithms, in the case of software) cannot possibly be considered inventions, as they are based on concepts discovered over years in the various fields of knowledge and that are now applied to the computer world. The cost and risk associated with a patent, although mis-

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The exception relating to decompiling for interoperability purposes established by author's rights and copyrights is provided to allow determining the "ideas" underlying the computer program, in certain cases subject to limitations imposed by law.

takenly granted on an invention that is not in fact new, could prevent any development requiring the use of the underlying concept.

An algorithm, especially, as it is a sequence of instructions destined for the performance of a specific task, may encompass both "technical" and "non technical" processes. But analysed in abstract and in terms of pure logic, an algorithm does not have physical points of reference, as it may be applied to many different functions. Along these lines, an algorithm should not be the subject of a monopoly. Free software could be limited in the use of ideas and/or algorithms that, in truth, should not have been patented for going against the principles upon which patents should be based.

- **Incremental innovation.** Computer innovation is not achieved by great leaps based on brilliant inventions, but is mainly incremental. Any application contains many small techniques and practices that, if patented, would imply an unbearable burden on the development and marketing of software due to the cost of checking for patents on every detail. The amount of patents necessary to produce a single product could be in the thousands.

On the other hand, in other fields of technological development, in which the practice of patentability is justified, the amount of patents per marketable product tends to be much lower (for instance, in the case of the pharmaceutical industry, where generally a single patent is applied to a drug or process).

- **Minefields: impossible searches.** In the case of software patents, detecting whether a product contains a code subject to a patent tends to have a cost that is often greater than that of the creation of the affected code, for two reasons:
 - The large number of patents existing in the countries where software patents are accepted.
 - The language in which the protected processes are described, which differs significantly from the traditional language used by programmers and requires long interactions between lawyers and programmers for both parties to understand what is actually protected by the patent in question. Even if it were possible to conduct a thorough study of the existence of potential problems with the software patents for a product, it would be impossible to guarantee that it would not be necessary to license a patent.

On the one hand, it is difficult to conduct extensive and exhaustive searches due to the amount of potential patents involved and, on the other, it is possible that after finishing a product, another person or company that has developed the method earlier, could request a patent. This fact causes an uncertainty that does not exist with other forms of protection of immaterial goods, such as author's rights.

Unix Compress

An example of this is what occurred with Unix Compress. The program was created in 1984, and in 1985, a patent was granted on algorithm LZW. This made Unix Compress illegal from one day to the next, until a licence existed allowing its use. The practice of using a patent precedent search database as a means of information within the process of development of a computer-related product not only does not exist, but also would be useless even if it were instated due to its inherent inefficiency. In spite of this, there is

talk of using free software repositories as a precedents base, to identify, if possible, various routines and establish a timestamp (to determine the publication date).

All this affects the development of free software as it hinders the capacity of innovation and development of professionals and companies in this sector. Patenting prior modifications¹¹ and improvements is tantamount to aborting innovation.

⁽¹¹⁾Please see "Open source as prior art" at the LINUX Foundation site, in collaboration with the USPTO.

- **Standards and interoperability.** Software patents threaten the increasing importance attributed to software standards (formats, protocols, computer applications interfaces, etc.), to the extent in which they may hinder them.

The need to find common standards is more urgent every day. To grant a monopoly on a standard would vest its creator with absolute control over the products of all the competition and would prevent the interoperability of computer programs, to the extent that it could infringe upon the patent. Indeed, it would threaten the freedom of dissemination of the knowhow underlying any standard (by monopolising the means of expression). We must also not forget that there is a current search to boost access to the information society and that the possibility of connecting equipment to be interoperable is a means of guaranteeing open networks and avoiding the abuse of dominant positions.

For instance, the GIF standard could infringe upon patent number 4,464,650, relating to compression algorithm LZW, granted in 1981 by the United States Patent and Trademark Office (USPTO). We should examine, on the one hand, the possibility that a browser might be unable to read files in GIF format, which is commonly used by users. An example of the opposite is the standard for documents ODF (open document format), which is explicitly open to all.

These limitations would detract from the competitiveness of free software with respect to the "patented" standards of proprietary software and would prevent compatibility with the latter as it would not be possible to use patented formats or interfaces either.

- **Information obligations.** Software patents tend to promote industrial secrecy and encourage the abusive monopoly due to the interest that exists not to publish the source code in the description of the patent. This is inconsistent with the historical purpose of patents of promoting the sharing of knowledge. It also contributes to eliminating innovative competition, which is also inconsistent with its alleged economic effect.

The publication of the patent should include a description that would allow someone knowledgeable in the area to reproduce the process or invention, to justify the rewarding of the monopoly to the inventor. Nonetheless, as the source code is not included in patent documents, to reproduce a procedure it is necessary to redevelop the source code, which means that the contribution by a patent is, in the best of cases, dubious. For instance, in the case of inventions, it is necessary to provide drawings and diagrams that clearly explain how an element works within the system sought to be patented. In the case of the software, in practice, solely vague descriptions of the matter sought to be patented are added and it is necessary to develop the product to have a concrete and usable program.

In this regard, software patents do not foster research and development in the field of computer programs or the production of programs that better satisfy (in terms of both quality and quantity) the needs of the citizens and companies. The foregoing is completely contrary to the philosophy of free software, for which, due to the complexity of the current computer programs and the greater difficulty of decompiling and re-implementing a program from its object code, it is essential to have access to the source code to be able to improve the quality of the software developed in the world.

- **Interoperability.** It is argued that, in parallel with the exceptions to the author's rights with respect to decompiling for interoperability purposes, patent licences should be free or mandatory and granted without delay to allow for the interoperability between various computer programs. It should also be mandatory that the patent document includes information on the invention that would facilitate the task of the people wishing to adapt a program to another, already-existing one (incorporating the patented characteristics), or the possibility, in the event that patent rights be exercised abusively, of resorting to mandatory licences, and to antitrust legislation to achieve that the owner of the patent does not hold an abusive monopoly.
- **Costs.** Software patents are very costly and the procedure for obtaining them may be very long and complicated. In fact, it not only requires the payment of substantial fees during the procedure of application and granting, but also the fees of computer engineers and lawyers (and other professionals involved, as is convenient or necessary in the various legislative systems of each country). This is to develop the patent documents (particularly, setting out the claims in precise detail) and procedural follow up, not only by office (administratively), but also at the courts (contentious proceedings), which may imply years of expenses and headaches that are unbearable for smaller applicants. Additionally, the fact that it is necessary to justify that the software patent is implemented in a larger invention requires knowledge beyond mere programming, which implies a complicated assembly of products and a complex technology, i.e., it requires (expensive) qualified professionals.

On the other hand, this proposal makes no sense for free software, as its development generally does not require substantial R&D investments (as opposed to the sizable investments needed in the chemical industry, including pharmaceutical products, the medical industry or highly-specialised machinery sectors), often developed by small companies or independent computer programmers with scarce economic resources and less access to the necessary information to obtain and defend a patent. We must not forget that software in general, although a complex technology, is also open to small developers.

It is also impossible for the patent offices to know who an expert in the matter would be, in order to analyse whether a program is actually the

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Formats. About two years were needed for word processor developers to decompile the formats of the files of Microsoft Office 97 to be able to make their products compatible with the Microsoft products.

Recommended website

The Peer to Patent Project: Community Patent Review, <http://dotank.nyls.edu/communitypatent/index.php>, collaboration between the free community, IBM and the USPTO.

result of an inventive activity or the "normal" evolution of a concept. An idea to improve the expertise of patent offices (in the United States, where software patentability is legal) is to use social networks and peer review systems to identify an "expert in the matter".

- **Timing.** We cannot forget that some of the patent applications pending concession are initially secret and published thereafter (in the United States this usually takes around eighteen months). Nonetheless, during that time, a free software programmer may have developed the same idea in a completely independent manner and be sued for infringing upon a patent that was unknown to them, due to the retroactive effects of the patent (as of the date of application).

4. Conclusions

Trademarks and patents are different and complementary forms of protecting software and giving it (economic) value, however they are very different from author's rights.

- Trademarks protect the economic value of the name and reputation of a program and the project that supports it.
- Patents – supposing they are valid – protect the concepts and functionalities of software against the development and commercialisation of re-implementations of those functionalities.

While patents are anathema to free software, trademarks are specifically used within the community. Not to control the use of the software – usage rights are granted under the free software licences – but to control the quality and protect the reputation of the authors or project that sponsors the software. Established or commercially sponsored projects create "trademark policies" to enable the community to use the mark in a controlled but generally liberal manner. This promotes a wider dissemination of the project with greater legal certainty.

These forms of protection and concepts are now recognised by the free software community and incorporated into more recent free and open source software licences, to establish the ground rules:

- Patent grants on contributions, and patent peace clauses against patent claims (MPL, CPL/EPL, GPLv3).
- Trademark "obligations" or prohibitions of use (Apache, CPAL).
- Flexibility as to trademark or patent conditions (GPLv3).

These issues are becoming more and more relevant, as free software moves out of the laboratories, universities and grassroots communities, and moves into the mainstream (enterprise) software industry.

Recommended links

Mozilla: <http://www.mozilla.org/foundation/trademarks/policy.html>
Ubuntu: www.ubuntu.com/aboutus/trademarkpolicy

