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Software and business methods patents: Case law evolution and market strategies.

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Intellectual Property Rights for Business and Society

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Abstract

In this paper we explore the evolution of the software industry and the increasing importance of patent protection. Through a set of case law, we show that the various American Courts of Justice for the one hand and the European Patent Office (EPO) on the other hand have the same point of view by granting software patents. We put in light the crucial decisions that conduct to this situation. The same cannot be said, however, for another specific object: business methods. These systems, deeply involved in e-business, are perceived, on a legal point of view, in different way in Europe and in the US and accorded different levels of protection on either side of the Atlantic. We give also some figures of this phenomenon. They show the possible business methods protection in Europe in spite of the common argument of non-patentability of these systems in Europe. Furthermore, we also focus our attention on the effects of the intense use of industrial property on software and business methods, in terms of innovation, competition and the sharp rise in litigation.

1 Introduction

To an economist observing corporate strategy during this age of the emergence and development of internet and the digital economy, one thing is clear: the move towards a New Economy has heightened both the use and the strategic exploitation of intellectual property by economic players. The very particular field of research constituted by intellectual property, which draws on the scientific disciplines of economics and law as well as the field of management, has already been studied for several decades. It continues to arouse widespread curiosity now, because of the scale of the current phenomenon. Intellectual property and its subset, industrial property, have been in existence for a very long time (the origins of patents can be traced back to the *Parte Venezia* of fifteenth century Italy). But it is only over the last twenty years that its scope and use have grown on such a massive, unprecedented scale, accompanied by an equally dramatic rise in the difficulties it provokes. During the twentieth century, the protection of inventions by patent has regularly accompanied every new phase in technological innovation¹ (Kline and Rivette, 2000). And this trend has continued recently during the explosion of Internet and the digital economy, with software programmes, for example, which play an indispensable role in this domain, themselves becoming the object of patent protection.

Today, intellectual property is no longer simply a means of legally protecting inventions, as it was during previous phases of technological innovation. Now, there is more at stake than the simple concern to prevent plagiarism and pirating. This concern is now associated, at least for a certain number of economic players, with the need to go on the offensive, by introducing licensing policies or enhancing the value of immaterial assets. And this vision of intellectual property as a strategic tool cannot be attributed solely to companies. This point of view is shared by players of a more political or institutional nature, who envisage intellectual property as a weapon of economic competitiveness.

In section 2, we shall explore the way in which political and/or institutional authorities deal with intellectual property, particularly with the aim of boosting the competitiveness of certain sectors. More particularly, we focus on software and business methods patenting, where we observe the increasing importance of patent protection. We put in light the different law decisions that create the present patent protection for software and business methods. As a consequence, we found that the various American Courts of Justice one the one hand and the European Patent Office (EPO) one the other hand have the same position to grant patents on software. The same cannot be said, however, for another specific object: business methods. These systems, deeply involved in e-business, are perceived, in a legal point of view, in different ways in Europe and in the US and accorded different levels of protection on either side of the Atlantic. We give also some figures of this phenomenon. They show the possible business methods protection in Europe in spite of the common argument of non-patentability of these systems in Europe.

In section 3, we shall also focus our attention on the effects of the increasing use of industrial property, in terms of innovation, competition and the sharp rise in litigation.

¹ The telegraph and electricity in the 1880s, the car and aviation industries (1900-1920), aerospace and synthetic materials in the 1960s and the high-tech boom since the 1980s were all accompanied by an intensive wave of patent registrations.

2 Strengthening of intellectual property, software and business methods

2.1 Why more protection for software in the US?

The growing importance of software since the 1970s has been accompanied by reflection on the best means of protection to adopt for this technological object of an increasingly generic nature. During the 1960s and 1970s, software programmes only enjoyed limited protection. They were produced on order, for specific customers. The industry saw little need to establish high levels of protection because of the lack of compatibility between machines and programmes: this incompatibility generated its own *de facto* protection, and the implementation of legal means of appropriation was not considered. Trade secrets were the only method used to protect the source code of programmes (Graham and Mowery, 2002).

But the structure of the software market has changed since the 1970s: software developed for one customer and one very specific type of machine has given way to packaged software. In this context, programmes are being used on an ever-growing number of computers. The manufacturers, motivated by the objective of selling to the greatest possible number of customers and diffusing their programmes as widely as possible, have realised that protection by means of trade secrets has become outdated and ineffective.

Since 1978, the CONTU (National Commission on Technological Uses of Copyrighted Works), under Congress demand, has asserted its willingness to take software into account in the copyright area. The sole copyright regime was thus considered to be valid to protect software, in comparison with patent or trade secret. From a doctrinal viewpoint, the CONTU noted that the patent code requirement of novelty, non-obviousness and usefulness might be too high for computer software. In practice, the CONTU believed that the cost and time involved in obtaining patent protection augured ill for efficiency in the software area (Menell, 1990). Copyright, with its low requirements for protection and lengthy duration, was better suited for protecting software.

Following the CONTU's recommendations, the Congress amended the Copyright Law in 1980 in order to include software: *Computer software Copyright Law*. Courts nonetheless have explicitly categorised computer programs as "works of authorship" and more specifically, as "literary works": for simplification, courts have identified programs as literary works by simple reference to the statutory definition of the term "literary works". This definition is broad and thus encompasses computer programs written in symbols and embodied in various media, such as software, firmware or hardware. Of course, this way of considering software does not transform programs into real literary works. Even if computer programs look like literary works in their outward form, they are conceived and ultimately used as technology, not as literary works or literature (Schuster, 1992).

The law enforcement has caused many problems in the legal arena. First of all, the idea/expression dichotomy seems to be difficult to implement concerning software. In order to have some helpful tools, courts have used a certain number of tests such as the "abstraction test" (in *Nichols v. Universal Pictures Corp*), or the plurality of expressions doctrine (in *Lotus v. paperback International*). Second, as it is the case in a common law regime, the law of 1980 only provides a general framework and the role of case law is to clarify many points

(Menell, 1990; Samuelson, 2000). Few key decisions have expressed doubts about copyright efficiency for software. Even if the *Whelam v Jaslow* decision (1986) stated that “*structure, sequence and organisation*” of computer programs can be protected by copyright law (called *look and feel* of the program), other decisions have weakened those effects. The first decision to seriously challenge *Whelam’s* hegemony was *Computer Associates International Inc v. Altai Inc* (1992). The court in *Altai* reasoned that similarities in the structure of two programs might be due, for example, to functional constraints (such as the need to develop a program that would interoperate with another program), efficiency considerations, none of which protected by copyright law (Samuelson, 2000). The court directed that these and other unprotectable elements of programs be “filtered out” before infringement analysis began to ensure compliance with the directive of section 102(b) of the US copyright statute. The court ruled that some structural similarities in *Altai* were attributable to the fact that the two firms were developing programs to interoperate with the same IBM operating system programs. Those shared elements are therefore non-protectable by copyright.

In *Sega v Accolade* (1992), the reverse engineering process was forbidden, even if it was developed by a firm in order to create complementary products compatible with a competitor’s already marketed ones. Finally, in *Lotus v. Borland* (1995) the court held that a menu command was a method of operation, thus undeserving protection.

The manufacturers then lobbied for intensified protection through patents. So the strengthening in protection, through intellectual property, has indeed been the result of the growth in the standardised software market. In parallel, the emergence of Internet has been a crucial factor in explaining this desire to establish stronger protection for software. A channel wonderfully adapted to the instantaneous diffusion of digital works (literature, music, software programmes, etc.) without any reproduction costs, Internet has heightened the urgency for software producers to respond to these dramatic changes by pushing for stronger protection.

This emphasis on intellectual property can also be interpreted as an attempted solution to the weak competitiveness of the United States at the beginning of the 1980s, a period when the country was seeking new vectors of growth in the face of heightened competition from Asia and Germany. Academic research was running out of resources, because of cuts in research funding and the priority given to balancing the federal books. This resulted in the academic world moving closer to industry which, having reduced its own research capacities, was also seeking a rapprochement with the universities. In this context, the “military” arm of the strategy was the policy of intellectual property, which gave a massive boost to academic research on the one hand, and extended patent protection to new domains, offering new opportunities for competitiveness, on the other².

2.2 Wholesale patent protection in the United States: from software patent to business methods patents

Software has traditionally been considered as a work of authorship. As such, it has been covered by the *droit d’auteur* in Europe or by copyright in the United States. But over the last twenty years, and more particularly the last ten years, American law has been modified by numerous cases of jurisprudence, with the result that patents are assuming an ever more

² Thus, from 1980 on, numerous legislative measures, based on R&D and intellectual property rights, were taken to restore American competitiveness (Orsi, 2002). The software sector, together with that of living matter, helped to recover competitiveness in the 1990s.

important role in the protection of software. This trend has also been evident in Europe, where several decisions by the European Patent Office (EPO) now offer the possibility of patenting computer programmes, but in a more restricted manner than in the United States.

In the U.S., the traditional framework of software protection by copyright has been overturned by a series of cases of jurisprudence. This movement, which has really got under way since the 1980s, has gradually led to the juridical acceptance of patent protection. This can be explained by one underlying reason: copyright protection and patent protection do not have the same scope. The creator of software protected by copyright can, if he so wishes, prohibit the reproduction of his work and limit the spread of license concessions of his copyright. The problem resides in the behaviour of his competitors (do they draw inspiration from his software to offer a similar product?) and questions relating to reverse engineering (Desrousseaux, 2000). We know that ideas are not appropriable. Only the form is protected by copyright (not the function). But as a given functionality can often be achieved through more than one way of programming, a rival who has no right, theoretically, to copy a certain programme can create a different programme (thus getting round the copyright) offering the same functionality. In this case, it is very difficult to judge on a possible infringement of copyright, especially if the competitor has used the “clean room” method³. And although reverse engineering is theoretically prohibited, it is actually necessary in certain situations (e.g. the development of software interfaces). In this context, it is difficult to bring the juridical framework of copyright into play to protect against the actions of a rival.

Unlike copyright, patents on software protect the functional interrelations between the technological components of the system (Skulikaris, 2001). Consequently, it is no longer the form of the software that is protected, but a series of functions (functional protection) – the result, in other words. Here, the protection provided by patents appears to be stronger than that provided by copyright.

Case law

In the United States, the decisive turning point came in 1980 with the case *Diamond v Diehr*. Up until this date, the Supreme Court of the United States, the court of last resort for patent disputes, had systematically supported the USPTO (US Patent and Trademark Office) in its desire not to grant patents on software. With this case, on the contrary, it opened the door to the possibility of patenting software. The Supreme Court ruled that the patent claim covered the whole invention, not just the algorithm used to make the invention function⁴. In this case, the applicant could obtain a patent.

This watershed decision paved the way for a whole wave of subsequent decisions allowing patents on software, as long as the invention was “useful” (Liotard, 2002). In particular, it led to the *State Street v Signature* ruling of 1998 on the possibility of patenting “business methods” (see below). This term refers to a certain number of tools that can be useful in “doing business”. In the United States, this term is used for many applications that are now patentable: management or financial data processing methods, computing techniques and

³ This procedure was developed in the United States to “draw on” the rival’s protected software without risking an infringement of copyright. There are two stages: (1) a first team is brought together: it analyses the rival’s software and draws up the functional specification; (2) the first team leaves the room. A second team comes in (without communicating with the first team) and uses the functional specification to design the programme to be marketed.

⁴ The Court ruled that a claim could be patentable even if it used a mathematical algorithm in the process, arguing that the inventor did not claim all his rights over future uses of the mathematical equation in question, but only for the particular application he had invented.

educational, organisational, e-business, consulting, marketing or financial methods. In the field of e-business, patents have been granted for systems of e-finance, on-line bookselling and auctions (Lerner, 2000; Hall, 2003).⁵.

In the US a first attempt to define business methods is contained in the “Business Methods Patent Improvement Act” which was first proposed to the US Congress in 2000. The proposal defines business methods as “(1) a method of – (A) administering, managing or otherwise operating an enterprise or organisation, including a technique used in doing or conducting business; or (B) processing financial data; (2) any technique used in athletics, instruction, or personal skills; and (3) any computer-assisted implementation of a method described in paragraph (1) or a technique described in paragraph (2)».

The US Congress did not accept the proposed bill and therefore current US laws do not contain a legal definition of the term business methods.

The one click system of Amazon.com is called “method and system for placing a purchase order via a communications network” (patent US n° 5.960.411°. This program stores a customer’s address and credit card number in a database. The program allows the customer to make a purchase with a single mouse click.

Another recent patent of Amazon.com (methods and systems of assisting users in purchasing item n° 6.865.546, March 2005) allows gathering clues about customer’s gift-giving habits in order to suggest future gifts and reminders.

In 1998, Walker Digital Inc. obtained a patent (n° 5.794.207) on a computer system and software that enable reverse auctions over a communications network.

In 1982 Merrill Lynch received a patent (n° 4.346.442) on a computer and software that enabled financial transactions for the cash management accounts it offered to investors.

State Street v Signature case law

The last barrier to patentability fell down in 1998 in *State Street Bank v Signature Financial Group Inc*, with permission to patent a “business method”. The case involved two financial companies: State Street Bank and a smaller one, Signature Financial. The latter had developed and patented a data processing system for administering a “hub and spoke” mutual fund family. Signature’s system allowed mutual funds (spokes) to pool their assets into an investment portfolio (hub) which was organised as a partnership. The system calculated a number of factors on a daily basis, including each spoke’s percentage share of the hub’s assets and expenses. This arrangement allowed individual mutual funds to benefit from various administrative and tax advantages (Henry, 2000). State Street wanted to pay a license for this system but the negotiations broke down and State Street filed a suit, claiming that the patent was invalid.

The Court of Massachusetts’ judges established that the patent was invalid because of its mathematical algorithm and business methods characteristics. Contrary to this decision, the CAFC (Court of Appeal of the Federal Circuit) concluded that the patent had to be granted. This decision was essentially two-pronged. It first stated that inventions based on mathematical algorithm formulas or calculations would be eligible for patent consideration so long as they produced a useful, concrete and tangible result (which was the case with Signature’s invention). The court defined an abstract idea as “*constituting disembodied concepts or truths that are not useful*” and stated that “*from a practical standpoint, this means that to be patentable an algorithm must be applied in a useful way*” (Ogden, 2000). The physical need is over with this decision. Finally “*we hold that the transformation of data representing discrete dollar amounts, by a machine through a series of mathematical*

⁵ See, for example, the “one-click” system of Amazon.com

calculations into a final share price, constitutes a practical application of a mathematical algorithm (...) because it produces a useful, concrete and tangible result – a final share price". The final share price was deemed a "useful, concrete, and tangible result" *because it was "momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades"*. The central point is that business methods are therefore not merely a manipulation of an abstract idea.

The second point struck down the long-accepted rule that an invention is not patentable if it applies to a method of doing business. According to Judge Rich of the CAFC, the exclusion of business methods resulted from an interpretation mistake in *Hotel Security Cheking Co v Lorraine Co* (1908). The method involved was designed to prevent fraud and speculation by waiters and cashiers in hotels and restaurants (Saladi, 1999). The court did not find the invention new and useful and considered that it suffered from lack of physicality. In conclusion, the court stated there was "*no patentable novelty ... in the physical means*". This decision had a crucial role because decade after decade judges believed that business methods were not patentable. In *State Street* judge Rich stated "*since the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method*"

This decision drew some attention since it concerned two major economic sectors– financial services and software – and thus caused each sector's protagonists to react (state Street was supported by VISA and MasterCard; Signature by the major protagonists in the software industry). Furthermore, this decision opened the way to the patentability of all business methods so far as the algorithm produces a "useful, concrete and tangible result".

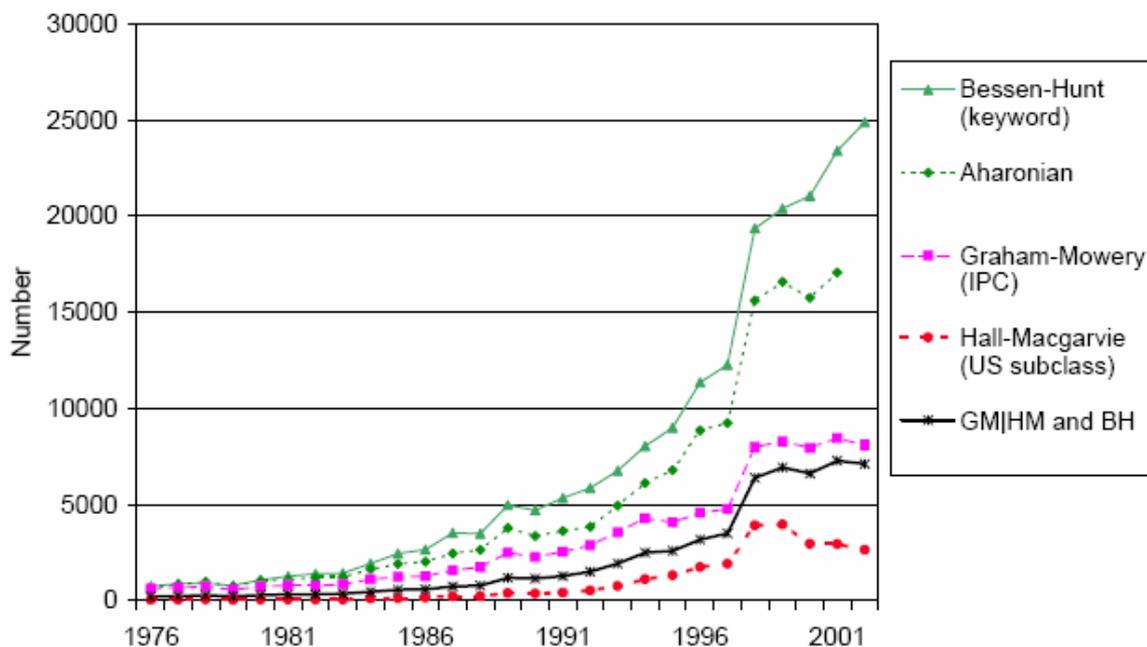
Some figures

As a result of this series of rulings and case law, the number of applications for software patents, especially internet-related patents, has rocketed in the recent past (Hunt, 2001). In parallel with the overall number of patents in the United States, software-related patents have risen sharply, leading the USPTO to grant between 7,000 and 10,000 software patents, in a broad sense, per year. This figure rose to 25,000 patents per year in 2002 (Hunt and Bessen, 2004). It is interesting to note that this growth can be observed both for national and international applications (Graham and Mowery, 2002). Moreover, the companies most active in software patent applications are not packaged-software firms like Microsoft, but the twelve major players in the electronics sector⁶.

As Hall and MacGarvie (2006) have shown, and despite the different software patent definitions, one can observe the tremendous trend of software patents granted in the US from 1976 to 2001, with especially a accelerated increase from the mid of 90's. (Figure 1)

⁶ IBM, Intel, HP, Motorola, National Semiconductor, NEC, Digital Equipment Corp, Compaq, Hitachi, Fujitsu, Texas Instruments, Toshiba.

Figure 1: software patents granted (in the US)



Source: Hall and Macgarvie (2006)

As for business methods, the 1990s saw an accelerated growth in internet-related patents in this domain. Less than 100 patents of this genre were granted before 1992 (Hunt, 2001). During the next five years, the Office granted 750 internet-related patents and then, from 1998 on, the growth was astronomical. Nearly 4,000 were granted in 1999 and 5,700 in 2000, mainly to computing and telecommunications component manufacturers and software developers.

The evolution of technologies in class 705⁷ can be observed by reviewing business methods assignees over three periods (USPTO White Paper, 2001). As shown in table 1, in the period prior to 1990, Business Methods patents were heavily focused on computerised postage metering and cash register systems. The end of 1994 placed heavier emphasis placed on financial transaction systems. By the end of 1999, electronic shopping and financial systems were the two dominant categories.

⁷ The USPTO class 705 gathers business methods patents. This class, created in 1997, is defined as “data processing: financial, business practice, management or cost/price determination”. (Hall, 2003).

Table 1: three periods of business methods patents

Ranking	1977 – 1989 (13 year span)		1990 – 1994 (5 year span)		1995 - 1999 (5 year span)	
1	Pitney-Bowes	134	Pitney-Bowes	47	Pitney-Bowes	77
2	Sharp Corporation	39	IBM	32	Fujitsu LTD	64
3	Omron Electronics	31	Hitachi	23	IBM	58
4	IBM	26	Sharp	11	NCR	30
5	Casio	21	Omron	9	Hitachi	27
6	Tokyo Electric	21	* Alcatel Business System	9	Citibank	22
7	Hitachi	10	NCR	6	* EDS	21
8	NCR	7	* AT&T	6	* Microsoft	20
9	Toshiba	6	* Unisys	6	* Neopost	16
10	Merrill Lynch Attalla Technovations	5 5	Casio * Frama A. G.	5 5	* Matsushita Electric Industrial	16

* indicates a new assignee from the previous period

source : USPTO white Paper (2001)

Table 2 shows that «old economy» firms are well represented in business methods patenting (Cockburn, 2002) and have consolidated their rank from 1999 with IBM always at the first place (and a new comer: Microsoft).

Table 2: class 705: three years of business methods patents number by firm

rang	1999		2000		2001	
1	IBM	39	IBM	76	IBM	72
2	FUJITSU LTD	32	PITNEY BOWES	42	NIPPON ELECTRIC CO	42
3	PITNEY BOWES	26	NCR CORP	24	WALKER DIGITAL	28
4	NCR CORP	24	FUJITSU LTD	22	PITNEY BOWES	24
5	HITACHI	22	HITACHI	21	FUJITSU LTD	20
6	ELECTRONIC DATA SYST	14	AT&T CORP	15	NCR CORP	20
7	MICROSOFT	13	MICROSOFT	15	HITACHI	19
8	AT&T CORP	12	WALKER DIGITAL	12	MATSUSHITA ELECTRIC IND	17
9	WALKER ASSET MANAGEMENT	12	CITIBANK	11	MICROSOFT	17
10	CITIBANK	11	MATSUSHITA ELECTRIC IND	11	SONY CORP	17

Source : USPAT

2.3 Prudence in Europe

Two underlying trends stand out in Europe's approach to the question of strengthening property rights in the fields of software and business methods.

Firstly, article 52(2) (c) and article 52(3) of the European Patent Convention, signed in Munich on 5 October 1973, exclude from patentability “*schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers (...) as such*”. Some national laws have also considered software in a similar way and for instance, the French law in L 611-10, establishes that computer programs are excluded from patentability. They are excluded from patentability by law on account of their mathematical formula criterion. Moreover, according to the traditional juridical viewpoint, a program cannot be considered as an invention because it does not produce a technical effect, which is the *sine qua non* condition to obtain a patent.

But the practice has been quite different. Over the last twenty years, the Office has granted patents on software programmes, as long as they meet the technical criteria required by the examiner. Following three key decisions by the Boards of Appeal of the EPO⁸, a computer programme can obtain patent protection if there is a “further technical effect”, whether direct or potential (Schwarz, 1997). Similarly, in France, the *Schlumberger c INPI* decision (1981) was the first one to grant a patent to an invention including a computer program.

Case law

In *Vicom*, the Board slowly began to sketch the boundaries between a computer program as such on the one hand, and an invention making a technical contribution, albeit implemented in software on the other. The invention has to create a technical effect to be patented and *Vicom*'s invention (a method of digitally processing images in the form of a two-dimensional array) is a technical problem. More precisely, under the “contribution approach” the invention contribution states the problem to solve. Consequently, the exclusion of computer programs or mathematical methods as such from patentability (article 52) does not preclude computer-related inventions in general. If it could be demonstrated that the claim as a whole referred to more than just a mathematical method, a mental act or a method of doing business, patentability was assumed (Skulikaris, 2001).

Step by step, the patentability area has spread to computer activity, and more precisely to the business methods area. In *Sohei/General purpose management system* (T769/92(1995)) the Board of Appeal granted a patent to a computer system and a method for plural types of independent management. According to the Board, the technical contribution to the prior art could be either a technical problem (to be) solved or a technical effect achieved by the solution. The need for such technical considerations would in itself imply the occurrence of a technical problem to be solved and technical features solving that technical problem.

But the contribution approach practice has been criticised for being too long: examiners have to examine novelty and inventive activity twice, through article 52 and articles 54 and 56 (Szeleper, 2001). Two EPO Boards of Appeal's recent decisions and more particularly the *IBM* decision revised the contribution approach (T1173/97 (1999)). According to the new trend, a computer program can be considered a patentable invention if, when run on a computer, it creates a “further technical effect»: a technical effect that goes beyond the normal physical

⁸ These decisions are: Computer-related invention / *Vicom* T208/84 (1987) JO EPO 14; General purpose management system / *Sohei* T769/92 (1995) JO EPO 525; Computer program product / *IBM* T 1173/97 (1999) JO EPO 10.

interaction between hardware and software. The Board considers a technical character in further effects deriving from the execution of the instructions given by the computer program where these further effects have a technical character or cause the software to solve a technical problem. Thanks to this case law, a computer program inventing a new way of display or visualization can be patented.

Some figures

Today, around 30,000 software-related patents have been granted by the EPO, the majority of them dealing with digital data processing, data recognition and information representation and processing (Van Den Bulck, 2005⁹).

Although, in practice, many software patents have been granted in Europe, the prevarication we have seen over the last two years in the drafting of a directive on the subject highlights the difficulty Europeans have in reaching agreement. The shuttling back and forth of proposals between the European Parliament, the Council of Ministers and the European Commission has further complicated matters, particularly given the divergent positions on the subject of software patentability. The last text proposed by the Council of Ministers, dated March 7 2005, was submitted for a second reading in the European Parliament, which rejected it outright in July of the same year. So at present, Europe remains in the same state of affairs, where theory (the European Patent Convention) and practice (the EPO) are opposed. According to some commentators, this situation is actually worse, because the refusal to formalise EPO practice threatens the precarious existing equilibrium and encourages national jurisdictions to take more liberties in their appreciation of software patents¹⁰.

However, on a legal point of view, Europe is far from sharing the American enthusiasm for the patenting of business methods, whether we examine French jurisprudence¹¹ or that emanating from the European Patent Office (Warusfel, 2001 and 2003). Although more and more applications for business method patents are submitted¹², the EPO has maintained its position on the non-patentability of business methods which lack the technical character that is a pre-requisite for the granting of any patent. This was especially clear in the Pension Benefit System case (T931/95) of September 8 2000, brought before the Technical Board of Appeal of the EPO, in which the applicant was seeking a patent on a method of controlling a pension benefit system. According to the Board, not only did the process have no technical character, but it also resulted in no technical objective or effect.

A recent study has given few interesting results concerning business methods patents in Europe (Wagner, 2004)¹³. On a sample of 1900-business patent application, 689 granted patents on business methods in Europe were identified (these figures are opposed of the current point of view about non patentability of business methods in Europe). The main results show that American applicants file more than 56 % of all applications for business method patents in Europe. Figure 2 shows the tremendous growth of American applications between 1993 and 1998 (This trend is related to the US court decision and enforcement case).

⁹ “*Le Conseil Européen passe outre la volonté du Parlement et adopte la position commune sur la brevetabilité des logiciels*”, actualité of 7 March 2005 <http://www.droit-technologie.org>.

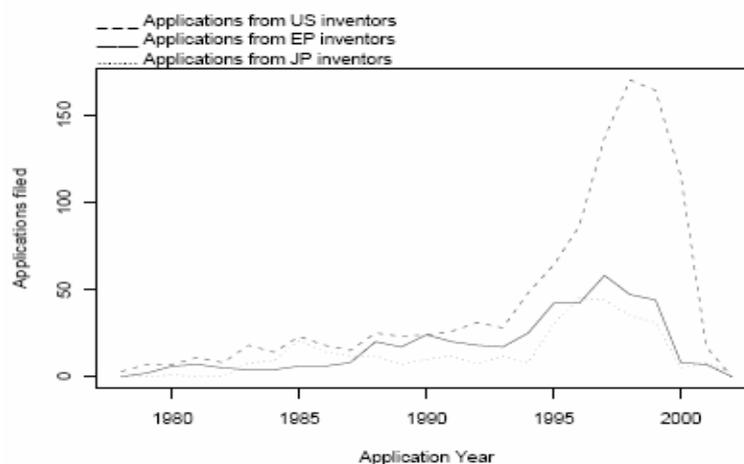
¹⁰ The consultation initiated by the European Commission in January 2006 has revived the debate on software patenting, in a broader context (that of Community Patents).

¹¹ See the decision of the Court of Appeal of Paris of January 10 2003 in the case Sagem versus INPI or the decision of the Court of Appeal of Rennes of October 7 2003 in the *Antonietti* case.

¹² Business methods are categorised in the class G06F17/60 in Europe. Notable examples include an application for a system to monitor the financial parameters of a stock market (application FR 2.765.368) or a home-financing system comprising an income-based mortgage (application FR 2.669.449).

¹³ See also Likhovski et alii, 2000.

Figure 2: Number of applications for business methods patents filed by applications year and country of origin of the inventor



Source: Wagner (2004)

Table 3 lists the 14 most active applicants for business method patents at the EPO. Most of them are multinational corporations from technological fields like consumer electronics, computer technology and telecommunications, which patent a variety of different business methods¹⁴. As it has shown in paragraph 1.2, the franking machine industry is well represented in this chart. Pitney Bowes (US), Francotyp-Postalia (DE) and Neopost (UK) are specialists in the niche for mailroom technology like franking or inserting machines and services providers for mail processing in companies (Wagner, 2004).

Table 3: Most important patent applicants for business method patents at the EPO 1978-2003.

Patent Applicant	Country	Applications	Patents granted	Oppositions received	Patents revoked
Pitney Bowes	US	192	99	67	26
IBM Corp.	US	99	46	1	0
NCR	US	71	20	2	1
Francotyp-Postalia	DE	46	11	1	0
Neopost Ltd.	UK	45	27	5	2
AT&T	US	39	11	1	1
Fujitsu	JP	37	15	1	1
Hitachi	JP	35	9	1	1
Sony	JP	30	10	0	0
Siemens	DE	24	12	3	2
Matsushita Electr.	JP	23	9	0	0
Toshiba	JP	21	15	4	1
Sharp	JP	20	12	0	0
Sun Microsystems	US	16	5	0	0
Total		778	345	91	37

Source: Wagner, 2004.

¹⁴ “apparatus and methods for executing game programs having advertisements therein” (EP 19960304685, Sony), “system for providing targeted internet information to mobile agents” (EP 19980935928 (Siemens).

3 ECONOMIC AND STRATEGIC CONSEQUENCES

The opening of the door to software patents twenty years ago, and to business methods more recently, raises several questions.

3.1 Innovation.

The software industry is a sequential activity characterised by successive, complementary innovations (Bessen and Maskin, 2000; Merges and Nelson, 1994). Like the telecommunications or semiconductor industries, this is a cumulative activity in which previous innovations always serve as the foundation for subsequent innovations, rather like a pyramid (Shapiro, 2001). In addition, the increasingly important role of software in the technologies of a growing number of sectors means that applications are incredibly varied and involve more traditional sectors (the car industry, for example) just as much as high technology sectors. On these grounds, it is reasonable to wonder whether the strengthening of the protection of software may have deleterious effects on the rate of innovation. Today, it is almost impossible for a software editor or programmer not to encroach on what has already been produced: software is like a set of Russian dolls, in which each system fits into another. If part of the system is protected by patent, the risk is that this may slow down or even paralyse innovation. We have only to refer to the literature developed by Scotchmer (1991), who analysed the relations between basic innovation and second generation innovation. The protection conditions of the basic patent (in terms of scope, claim, etc.) have an important influence on the incentives of future innovators to invest in R&D.

Certain economists have echoed these concerns. Shapiro (2001), for example, highlights the fact that the current American patent system generates relatively perverse effects on innovation and raises barriers to the entry of new players, blocking the construction of the famous R&D pyramid with a “patent thicket”.

Under these circumstances, the question facing Europeans is whether their refusal to patent business methods on the one hand, and their recent back-tracking on software patents on the other, will have an unfavourable impact on firms’ competitiveness (Liotard, 2004). At the present time, we are still in the realm of questions: how can a European firm be competitive vis-à-vis an American rival which, thanks to its patents, can not only prevent the European firm from penetrating the U.S., but also directly challenge it on its own territory? This situation could be prejudicial to European companies, by increasing their costs. How can we resolve the juridical imbroglio of the Internet, a global system par excellence, whose Web functions and develops within territorial legal systems? Clearly, the problems just keep on arising, and the task facing the European authorities today is to take all these elements into consideration in a profound investigation of the matter.

3.2 Legal proceedings and licensing strategies

Because of this multitude of patents, the number of lawsuits and license agreements required to resolve these conflicts has risen disproportionately, even opposing small and large companies¹⁵. Under these circumstances, the concerns about the software sector are serious, all the more so since its involvement in and relations with the domain of the Internet and e-

¹⁵ For example, the lawsuit between Intertrust Technologies and Microsoft over patents held by the former and which were alleged to have been used by the latter for the Windows Media system (Shapiro 2001).

business are becoming ever denser. The principal fear today concerns the effects of software and business methods patentability on the development of the Web and the possible strategies of players that are beginning to appear. The growing number of lawsuits for infringement of software patents in the United States is an indicator of new trends and of attempts to block awkward rivals¹⁶. Litigations over industrial property grew three times as fast as civil cases in the United States between 1993 and 2002 (FTI Intellectual Property 2003).

These multiple lawsuits have been excessively costly for business: the cost a lawsuit for one single patent has been estimated at 1.2 million dollars¹⁷. The direct consequence of this is that small firms have great difficulty in defying larger firms on this terrain, where the larger firms have been likened to a “small mafia of monopoly holders” (Gleick 2000). In addition, the big firms now pull even more weight on the technological scene, thanks to their patent portfolios and licensing practices (in all forms: simple, crossed, patent pools). So in the United States, the income generated by license agreements grew from 15 billion dollars in 1990 to 100 billion in 1998 and 130 billion in 2000. IBM alone generates 1.6 billion dollars in licenses.

However, these observations on litigation need to be qualified. Given the very high cost of lawsuits (especially during what is called the “discovery” phase in the United States), very few disputes get taken as far as court action, as the parties involved negotiate well before this. About 80% of disputes are settled out of court, by means of license agreements. These data corroborate the idea that lawsuits are a real corporate weapon, seen by firms as a strategic tool for achieving their objectives, without necessarily going as far as a court decision at the end of a long and costly process. For certain firms, this can represent a means of driving their rivals into a corner, obliging them either to issue or to pay for licenses under the threat of pursuing the legal proceedings. In the case of lawsuits involving patents on business methods, the most important disputes have all been resolved by license agreements before the end of the court action.

So a portfolio of patents on software or business methods puts the holder in a strong position as regards the negotiation of licenses, resulting in a sort of “reign of terror” where competitors are constantly under the threat of lawsuits. The high number of disputes involving financial patents after 1998 bears witness to this (Lytle and Signore, 2004). The vast majority of cases involving players in the spheres of finance or insurance have resulted in victory for the patent holders, who can, thanks to legal action, bring an end to their competitors’ activities, obtain damages, receive license fees, sign crossed license agreements or defend themselves against other holders. Because the patentability of business methods is a relatively recent phenomenon, it is still difficult to give a definitive opinion on the effects this sort of protection is having on the nature and rate of innovation. Still, we can put forward certain hypotheses: it is clear that we are witnessing a proliferation in such patents, and the number of lawsuits is growing as a consequence, increasing the overall costs of the system. It is reasonable to believe that, as has been observed in other industries, these patents are a vector for capturing rents through license agreements, as well as a means of obtaining their financing, particularly through venture capital.

One interesting example of this situation is the franking machine industry (Wagner, 2004). The study puts in light the effects of business methods patents and firm strategy. More particularly, it is shown that Pitney Bowes’ IP¹⁸ strategy focuses on building a very broad

¹⁶ Amazon.com vs Barnes&Noble, Priceline v Expedia: see the synthetic table proposed by Hall (2003) for examples of lawsuits.

¹⁷ The AIPLA Economic Report (2001) estimates that for each of the parties involved in a lawsuit, the average cost rose from 400,000\$ in 1999 to nearly 500,000\$ in 2001.

¹⁸ Pitney Bowes is the leader of the franking machine industry (62% of market share), followed by Neopost (22%) and Francotyp-Postalia (10%).

patent portfolio. This situation serves to increase the bargaining power of the firm in cross-licensing negotiation or in order to reduce competition in the market (Shapiro, 2001).

Wagner demonstrates that the patent strategy of Pitney Bowes is aggressive and dynamic. It started to patent in the early eighties whereas its competitors started about 5 to 10 years later. Furthermore, the cumulative figures show that the patent portfolio of Pitney Bowes is threefold the portfolio of Neopost for example. More precisely, the share of business methods patent in the Pitney Bowes' portfolio is highest with 27% of all patents.

As an example, Pitney Bowes has received 400 Millions dollars from patent infringement suit with HP resulting in widespread cross-licensing agreement in 1997. More recently, the firm settled an infringement case involving business methods patents with the major providers for internet-based postage systems (Stamps.com and E-stamps.com). The settlement included a five-year cross licensing agreement allowing Pitney Bowes to access patents for online franking system owned by the two firms.

3.3 Patent quality and the institutional bias

At the early stage of software patent, there was growing scepticism among commentators about the value of software patents. Aharonian (1998)¹⁹ showed that most software patents have no value when considering the patent requirements of novelty, inventiveness and non-obviousness. According to the author, a majority of them are merely the enforcement of well-known results in mathematics or publishing papers. Moreover, the prior art citation is very low.

Many explanations have been offered. For instance, the examiners' low expertise is often underlined. The USPTO framework itself is considered inefficient because its classification system has not historically been equipped to handle software patents. Cohen and Lemley (2000) note that they tended to be classified according to the field in which the software will ultimately be used rather than according to the nature of the software invention: this in turn makes it much harder for examiners to find what prior art exists. As explained by Cohen (1995): *"In the field of computers and computer programs, much that qualifies as prior art outside the areas in which the PTO has traditionally looked – previously issued patents and previous scholarly publications. Many new developments in computer programming are not documented in scholarly publications at all. Some are simply incorporated into products and placed on the market; others are discussed only in textbooks or user handbooks that are not available to examiners on line. In an area that relies so heavily on published, official prior art, a rejection based on "common industry knowledge" that does not appear in the scholarly literature is unlikely"*.

The increasing trend of software patents could also be explained by the USPTO institutional bias (Merges, 1999), i.e. the examiners' wage system and low training. The patent compensation system is twofold: a combination of base salary and bonus, and it directs the examiners' effort toward their own examining activities (no bonus point for training younger examiners). Furthermore, the only way to earn bonus points is to allow a patent application (and so, deliver patents).

Nevertheless the USPTO, in its White Paper (2001), took those problems into account and tried to bring solutions. Changes concerning examiners' recruitment and training, the reinforcement of data bases for the "prior art" were, for instance, underlined.

The CAFC (Court of Appeal of the federal Circuit) has also played a great role in the software-patenting trend. The CAFC was created in 1982 by a Congress law called the Federal Court Improvement Act. The CAFC has become the only court specialised in patent

¹⁹ <http://lpf.ai.mit.edu/Patents/ipns/ipns-19981018.txt>

conflicts and has replaced the old CCPA. Until 1982, 12 regional circuits existed but according to Nies (1993) “*certain courts of appeal were believed to favor patentees, others were considered sympathetic to infringers. This gave rise to “forum shopping” –pre litigation strategies and gamesmanship – directed to getting the litigation before a regional circuit court that would be the most sympathetic to one’s cause*”. The lack of uniformity in judges’ decisions led the Congress to create the CAFC. The study conducted by Allison and Lemley (1998) shows that the CAFC has made the granting of many more patents possible in appeals: before 1980 appeal decisions validated 62% of patents; after 1980, this rate reached 90% (1982-1990). (On the contrary, Kortum and Lerner (1998) testing the “friendly court” hypothesis do not validate this explanation). Similarly, Hunt (1999) notes that the CAFC decisions have changed the way courts consider the non obviousness criterion. Courts seem to have paid much particular attention to “secondary” factors (such as commercial success and long lasting need) whereas it would have been better to evaluate the non obviousness of the invention. As outlined by the author, in a 1983 decision, the court stated “indeed, evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have obvious in light of the prior art was not”.

The same problems appear with business methods: quality patents and institution problem. One of the major allegations against business method patents is the lack of novelty respectively non-obviousness of the protected inventions (Cooper Dreyfuss, 2000). The study conducted by Wagner (2004) shows that, in Europe, business methods patents are the most challenge by third parties through the post-grant opposition procedure. 16% of all granted business methods patents have been challenged at the EPO (period 1978-1999) while only 6% of all patent are opposed. And more than 41% of the opposed business method are declared invalid. As notes Wagner “*a higher revocation rate for business methods patents could therefore be interpreted as an indication that the EPO is not able to gather information during examination of business method patents as efficiently as in other technological areas*”. This allegation contributes to put some doubt on business patent quality.

4 Conclusion

This paper focuses on of software and business methods patentability and gives some key elements to understand the evolution of case law in the US and Europe. More precisely, we put in light the increasing number of patents and the type of firms, which obtain these patents. The main result show that USPTO and EPO have the same view concerning software patents. As for business methods, despite the legal differences into patent criteria (utility versus technical criteria), we put in light the possible business methods patents in Europe.

The growth of these kinds of patents has consequences in term of innovation and firms’ strategy. Few examples have been proposed to show how the portfolio strategy could be used to obtain favourable cross-licensing agreement.

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