

Software Patents in Europe

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1 Introduction

Article 52 of the European Patent Convention (EPC) has the following wording:¹

“Article 52

Patentable inventions

- (1) European patents shall be granted for 1) any inventions which 2) are susceptible of industrial application, which 3) are new and which 4) involve an inventive step.
- (2) *The following in particular shall not be regarded as inventions within the meaning of paragraph 1:*
 - (a) discoveries, scientific theories and mathematical methods;
 - (b) aesthetic creations;
 - (c) schemes, rules and methods for performing mental acts, playing games or doing business, and *programs for computers*;
 - (d) presentations of information.
- (3) 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 relates to *such subject-matter* or activities *as such*.”

As it transpires from the above provision, cf. section 2, paragraph c in fine in combination with section 3, programmes for computers “as such” are not considered inventions within the meaning of EPC and consequently, according to the convention, patents apparently cannot be issued for programmes for computers “as such”.

This seemingly simple provision has caused more attention over the last few years than one would imagine possible after the discussion about which form the proper legal protection of software should take died out in the 1980s when it became clear that most countries favoured copyright protection to patent protection and the *sui generis* protection proposed by WIPO.² However, over the last few years the debate has become more intense than ever before, and the question of whether patent protection should be available to software has attracted the interest of not only scholars and patent authorities but also to some extent the public at large, not to mention politicians, both at national and at EU level. For the time being, the climax of the debate seems to have been reached by the EU Parliament’s dismissal of a proposal from the EU Commission to harmonise at EU level the patenting of software within the EU member states.³

The debate has probably been initiated by a number of high profile cases such as the 1998 *State Street*-decision⁴ and the Amazon “one-click”-case,⁵ both from

¹ The numbers 1) to 4) in section 1 and italics have been inserted by the author. Section 4 is left out as it has no relevance here.

² WIPO Model Provisions on the protection of computer software (1978).

³ At its meeting on 23 September 2003, the Parliament effectively rejected the EU Commission’s proposal – COM (2002) 92 final – and came up with a radically amended proposal.

⁴ Cf. *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 U.S.P.Q. 2d 1596 and GRUR Int. 1999.96.

the U.S., and the fear of what software patents will mean to European software developers and users.

While it may be argued that any debate relating to possible unwanted effects as to the interpretation of current legislation or the implementation of new legislation should be welcomed, the current debate as to software patents to some extent seems to have run off the track. Thus, the debate seems to be taking place mainly between two groups of people, who claim to be either in favour of or against software patents without really wanting to discuss the real issues pertaining to such patents, but who are using arguments building almost on their beliefs only instead of facts, making the debate resemble a religious discussion instead of a legal ditto.

This article is an attempt to illustrate why the current debate is to some extent flawed and to suggest which issues the debate should be concentrating on in order to get back on track. In order to do this, the current legal position for obtaining software patents with the European Patent Organisation (EPO) based on leading case law is described, as the practice of this authority is *de facto* decisive for the legal position in Europe as a whole. This article is divided into the following paragraphs: paragraph 2 discusses the need for software patents; paragraph 3 describes the background for the software patent prohibition as found in EPC Article 52 (2) and (3), while paragraph 4 deals with the question of what is software? Paragraph 5 discusses software patents in practice and the requirements for patentability under the EPO, while paragraph 6 elaborates on the fundamental requirement for “technical character” and paragraph 7 discusses the need for a software patent exclusion. Finally, paragraph 8 concludes the article.

2 Why Patent Software?

The interest for patenting software arises partly from the perceived need by (some) software developers to protect the elements of software not protected by copyright law, *inter alia* software algorithms, which often constitute the most valuable part of the software. Adding to this, the use of patents may grant other advantages to the patent owner compared to his relying on secrecy, copyright or – if any – the protection provided by unfair competition law including rules of good marketing practices. For example, the existence of a granted patent or even just of a patent application may give a potential investor the impression that there is something of material value in the company holding the patent or the application.⁶ This may be more “psychological” than legal value of a patent may not be underestimated when looking at the perceived need for patents.

⁵ In December 1999, Amazon.com, Inc. managed to get a preliminary injunction issued against its main on-line competitor Barnesandnoble.com, Inc. claiming that the latter infringed its so-called “one-click” patent, US 5,960,411. The injunction was later vacated by the U.S. Federal Circuit Court of Appeals in its decision dated 14 February 2001 and the case remanded to the district court of Washington.

⁶ Venture capitalists are often claiming that they know only two things about patents: 1) that patents do not necessarily confer any real protection to the patent owner, and 2) that companies looking for venture capital need to have patents.

Furthermore, the existence of a patent may protect an investor or purchaser of a company or a technology against competition from former employees⁷ or owners of the company and in that sense help to secure the investment made. As a further example, the existence of a patent application or a patent may be used for marketing purposes or to deter competitors who cannot rely on the application not being granted, or in case of a granted patent, the patent not being valid. Finally, the need for patents may be initiated by the fear of losing the so-called “freedom to operate”, i.e., being forced by others holding patents to change or halt research and development in certain areas of technology or to pay royalties. In such cases a company may wish to hold patents of its own which can be used to enter into cross-licensing agreements with other patent owners.

It is a much debated topic between the interest groups in favour of and against software patents, whether the availability of such patents helps innovation or counters it. While the discussion will undoubtedly continue for years to come, it is safe to say that nobody really knows. It has to date not been established without uncertainty whether patents – or software patents – further or impede innovation in society as a whole.⁸ As to the entity holding the patent, it is estimated by Danish patent professionals – as a rule of thumb – that only one in ten patents is profitable. There may, however, cf. above, be other incentives for a company to apply for patents including software patents.

The existence of an adequate patent protection for software-related inventions has further been seen as a necessary prerequisite by the EU Commission for the development and strengthening of the European software industry.⁹ Thus, the Commission has made a proposal for a directive harmonising the patenting of software in the EU member states, cf. above, footnote no. 3. The proposal is briefly touched upon in paragraph 7.

While the need for patents on software-related inventions and the effects as to innovation and profitability may be debatable, there is no doubt that such patents are being issued by the EPO, which, according to a note by the president of the EPO dated 9 March 1993, at that time had granted more than 20,000 patents relating to software. According to a FAQ¹⁰ published by the EU Commission in 2002, the EPO had at that time granted 30,000 such patents. Thus, there is no doubt that the issue is of importance to software developers and society as a whole and that the existence of software patents is a factor which has to be taken into account by software developers, whether they like it or not.

⁷ According to a survey made by Masons, U.K., 70 per cent of programmers maintain a “personal” collection of source code which they bring along from one employer to the next, cf. *Computerworld online* (DK), 4 June 2004. Such practice is illegal cf. Article 2, paragraph 3 of Directive 91/250/EEC harmonising the copyright protection for software within the EU.

⁸ See e.g. the October 2003 report by the U.S. Federal Trade Commission, *To promote innovation: The proper balance of Competition and Patent Law and Policy*.

⁹ COM (97) 314 final.

¹⁰ Cf. *Proposal for a Directive on the patentability of computer-implemented inventions – frequently asked questions* – available on-line: “http://europa.eu.int/comm/internal_market/en/indprop/comp/02-32.htm”.

3 EPC Article 52 (2) and (3) and the Background for the Exclusion of Software Patents

It might be argued that the value of the preparatory works of the EPC – being a convention – when interpreting the EPC is very limited from a dogmatic legal viewpoint. The legislative history, however, do give some insight into the reasons for excluding software from patenting and the purpose of the prohibition clause. Furthermore, it is noteworthy that the EPO Boards of Appeal themselves often refer to the preparatory works in their decisions, and thus it is relevant to take a look at the background for the software exclusion.

EPC-work started out in 1959 and was concluded by the adoption of the convention at a diplomatic conference in October 1973. The convention entered into force on 7 October 1977. Originally, the draft EPC did not contain any exclusion as to the patentable subject-matter. However, in 1965, based on a joint German/Dutch proposal, a list containing subject-matter, i.e., “scientific knowledge and theories as such, mere discovery of substances occurring in nature, purely aesthetic creations, financial or accounting methods, rules for playing games or other systems, insofar as they are of purely abstract nature, methods of therapy, including diagnostic methods”, to be excluded from patenting was inserted in the draft by the working group preparing the convention.

The issue of software patents was initially touched upon at the conference in January 1970 at which the draft first published – also containing the above exclusions in a slightly amended form – was released. It was noted that it was at that time not possible to decide whether software was patentable subject-matter.¹¹ The exclusion relating to software was first introduced in January 1971 when it was decided that Article 9 (2) of the draft EPC should reflect Articles 39.1 and 69.1 of the Patent Cooperation Treaty (PCT) which had been agreed upon in June 1970.¹² However, as the prohibition was not to be considered final it was inserted in square brackets as to mark this fact. During the ongoing discussions, the UK delegates to the working group proposed that software was to be excluded from the patentable subject-matter and that a definition of “computer programme” should be made. The working group, however, did not want to define the term “computer programme” as it was the intention only to

¹¹ At that time the French government had passed legislation prohibiting the patenting of “les règles de jeux et tous autres systèmes de caractère abstrait, et notamment les programmes ou séries d’instructions pour déroulement des opérations d’une machine calculatrice”, cf. *the French Patent Act of 1968*, probably inspired by a similar initiative in the U.S., cf. *The Patent Reform Act of 1967*, which was, however, not passed. The then current case law was mainly characterised by the courts, the examining authorities and national boards of appeal disallowing patents relating to software related inventions, cf. e.g. *Slee & Harris Applications I – III* (I: U.K. – [1966] R.P.C. 194; II: Australia – GRUR Int. 1968.378, and III: Austria – GRUR Int. 1968.381), “Zinszahlen-Rechnenprogramm” (Austria – GRUR Int. 1968.211), “Algorismus” (Austria – GRUR Int. 1969.142), while such patents were granted in e.g. *Badger Co. Inc.’s Application* (U.K. – [1970] R.P.C. 36) and *Gevers’ Application* (U.K. – [1970] R.P.C. 91).

¹² It is noteworthy that the mentioned PCT provisions do not rule out software patents, but only exempt examination to the extent that the examining authority is not equipped to perform such examination.

implement broad guidelines, while the actual interpretation was left to the boards of appeal and the national courts. There was, however, a broad consensus that software should be excluded from the patentable subject-matter. This decision resulted in a number of protests by interest groups, inter alia claiming that software might be patentable subject-matter under certain circumstances and suggesting that the proposed Article 9 (2) was deleted.¹³ Following another round of discussions, the software prohibition found its final wording and place in Article 52 (2) (c).

During the diplomatic conference in 1973 – adopting the EPC – Article 52 (3) was inserted into the convention on a German initiative as to avoid that “a broad interpretation should be given to the items not limited in this way in paragraph 2”, i.e., that the same interpretation pertained to all of the excluded phenomena and not only to “discoveries as such” and “mere presentations of information”.¹⁴

While it is not possible based on the legislative history to draw conclusions as to the exact scope of the software exclusion provision or the intended effects hereof, it is possible to draw the following conclusions, 1) even though the term “technical” is not used in Article 52 (1), a patentable invention must involve some kind of technical progress in the sense that it must provide the society with new technical knowledge,¹⁵ 2) it was agreed to exclude “programs for computers” from the patentable subject-matter, however, there was no definition of the excluded subject-matter or any clear description of the anticipated effects of the exclusion, and 3) the “as such”-provision has no special bearing on the software prohibition, but was introduced to avoid to broad an interpretation of the bans relating to, inter alia, software, indicating that there should not prevail any special requirements for software-related inventions to be patentable compared to the other phenomena mentioned in Article 52 (2). Furthermore, the wording of the “as such”-provision itself and the circumstances pertaining to its implementation suggests that it is not difficult to “escape” the ban as it was the purpose of the German proposal to prevent a too broad application of the exclusion provisions.

EPC Article 52 (2) and (3) seem to allow two ways of interpretation. One according to which the phenomena listed are not inventions because they do not fulfil the criteria, e.g. the requirement of industrial applicability, for being so,¹⁶

¹³ Cf. Preparatory doc. BR/169/72, items 11 and 25.

¹⁴ Cf. the final 1972 draft of the EPC to be presented at the 1973 diplomatic conference, doc. M1, Article 50. At the time of the conference the U.S. Supreme Court had decided (20 November 1972) in the famous case *Gottschalk v. Benson*, 175 USPQ 673, that a method of converting binary code to pure binary was considered non-patentable. The same invention was, however, considered patentable by the German “Bundespatentgericht”, cf. its decision of 28 May 1973, cf. IIC 1974.211. These decisions were presumably well-known to the delegates of the convention and may be one of the reasons behind the German initiative.

¹⁵ It is not a requirement that the invention in itself is an example of technological progress, only that new technological knowledge is provided.

¹⁶ This is assumed, e.g. in the legislative history of the Danish Patent Act 1978, where software is characterised as “instructions for the human intellect”, cf. *Folketingstidende, Tillæg A, 1977-1978, 2106*. This view was in accordance with the so-called “mental act”-doctrine, that had developed in the U.S., cf. e.g., Beyer, Kristian E., *Patentering af computerprogrammer*, Justitia 1999, no. 4, p. 52.

and another whereby the phenomena may be part of an invention but to avoid to broad a protection may not be claimed on its own,¹⁷ exhausting all possible ways of employing the phenomena for practical use and thus impeding innovation. While it is not clear from the legal history which of the two possibilities is correct, the systematics of the EPC, when comparing Article 52 (2) and (3) to Article 53,¹⁸ seem to indicate that the first way of interpretation is correct, i.e., the excluded phenomena are not inventions. This view, however, seems to have been particularly troublesome in relation to software which have been shown to possess the qualities traditionally required by inventions, cf. below.

4 What is Software?

Before setting out to determine what software is, one might ask why such discussion is necessary. It is, however, imperative in order to have a meaningful discussion as to the patentability of software to agree as to the meaning of this term. Furthermore, it is important to note that when considering the scope of the prohibition, a definition is a must. Software is here used synonymously with the term “programmes for computers”. There is no set legal definition of software and the perception as to the nature of software has changed over time. This change has also influenced the patentability of software.

According to an early attempt from 1966, software was defined as “a series of instructions which control or condition the operation of a data processing machine”.¹⁹ Another early definition from 1968 further stressed the functional aspects of software: “A computer program at work in a digital computing machine is a complex set of coded electrical impulses. It tells the machine what to be.”²⁰ The difference between these definitions is that the first definition defines software in a static state as written instructions while the second definition stresses the dynamical aspects of software as electrical impulses.

The distinction between software in its static and dynamic states is reflected in numerous further software definitions. One example is found in WIPO’s Model Provision on the Protection of Software: “‘computer program’ means a set of instructions capable, when incorporated in a machine-readable medium of causing a machine having information-processing capabilities to indicate, perform or achieve a particular function, task or result”.²¹

The seemingly logical distinction between software in its “static” source code form and “dynamic” object code form is blurred by the fact that technological

¹⁷ See e.g. Josefson, Per, *Patent på datorprogram – en fråga om patentkravens bredd*, NIR 1998.58.

¹⁸ Stipulating inter alia that inventions contravening “ordre publique” cannot be patented.

¹⁹ Cf. *Report of Presidents Commission on the Patent System 17 November 1966 – To Promote the Progress of ... In an age of exploding Technology*, (U.S.) p. 13.

²⁰ Cf. the hearings on “*The Patent Reform Act of 1967*”, (U.S.) p. 751.

²¹ Cf. Section 1 (i) of the Model Provisions. The provisions did actually differentiate between software and programmes for computers cf. further Section 1 (iv) of the Model provisions, where “software” further encompassed program descriptions and supporting material.

advances make it increasingly difficult to distinguish between the two forms. This may be illustrated by the following quote:

“What is a program? At first glance, programs have two different sorts of manifestations. On the one hand, they are documents of some kind that give a series of instructions to be executed by a computer. But these passive documents can be turned into active psychical processes: when a program is executed, the instructions in the document are carried out. The program text is passive, but the executing program is an event in real time. Does “program” refer to the passive text, or the active event? The answer is both, because from our point of view ..., a program is a machine. The program text represents the machine before it has been turned on. The executing program represents the powered-up machine in active operation. There is no fundamental distinction between the passive program text and the active executing program, just as there is none between a machine before and after it is turned on.”²²

Technological developments further means that the instructions to the computer, cf. above, are often instructions to other computer programmes, i.e. operating systems or firmware.²³ This, however, does not alter the discussion as to the patenting of software in principle, but it must generally be assumed that it will be more difficult for programmes that are not interacting directly with hardware to be patentable, as such interaction is limited by the operating system which a priori makes it more difficult to provide interaction not already known from prior art.

The instructions referred to above describe the method or methods executed by the programme. These methods are often in connection with software referred to as “algorithms” and it is assumed that the term is inherited from mathematical sciences and that such software algorithms may – without further ado – be considered equal to mathematical methods. This, however, may be true in the sense that software algorithms in their format meet the requirements for mathematical algorithms,²⁴ but untrue in the sense that software algorithms do not necessarily only contain calculating steps but often also instructions – or orders – to a computer that has nothing to do with mathematical calculations.²⁵

Further, due to the way programming takes place and the resulting source code, software is often considered a kind of literature, which was one of the

²² Cf. Stobbs, Gregory A., *Software Patents*, 2nd ed., Aspen Law & Business, 2000, § 2.02, citing Gelernter, David & Jagannathan, Suresh, *Programming Linguistics I*, 1990. See also Kayton, *Patent protectability of software: background and current law*, *Jurimetrics Journal* 1969.127, categorising software as an “instant machine” partly replacing the hardwiring in a computer.

²³ Cf. e.g. Bender, Hanne, *EDB-rettigheder*, DJØF 1998, chapter 4.

²⁴ Cf. Nichols, *Inventing Software*, Westport 1998, p. 22, referring to Knuth, Donald E.: *The art of Computer Programming*, 3rd ed., vol. 1, p. 1.

²⁵ The Japanese Copyright Act defines a software algorithm as: “... a method for combining computer instructions in a program.”, cf. Article 10 (3) iii, cf. Karjala, Stephen, *Protection of Computer Programs Under Japanese Copyright Law*, *EIPR* 1986.105.

reasons for copyright being implemented as the proper form of protection during the 1980ies.²⁶

The distribution of software most often takes form in the format of an object code, normally on a CD-ROM or other media. However, distribution via networks, such as the Internet, is becoming more and more standard. Also, an increasing number of software developers are distributing their software under the so-called open source model, allowing software users and others to amend and improve the software, thus making their know-how freely available without the use of patents and to a certain extent releasing the users from the tight bands normally connected with software licences.

It is important to note, that while software may to a certain extent replace hardware, it is in principle possible to implement all functions of software in integrated circuits, i.e. hardware.²⁷ It is, however, far easier and more economical in real life to make use of standard processors and to utilise software on top of that. Seen from a time perspective, it may be concluded that more and more hardware has been replaced by software, and in that sense one might argue that the boundary between hardware and software has been obscured.²⁸

Further, it is important to note that the above suggests that software differs from the rest of the phenomena mentioned in EPC Article 52 (2) by being a means or tool for implementing the practical or industrial use of methods, inter alia the methods mentioned in said provision, e.g. business methods or mathematical formulae.

Finally, it must be emphasised that it is crucial to the discussion of software patents what is meant by “software”, cf. above. If one refers only to software as the source code on a piece of paper – so-called programme listings – any discussion as to the patentability thereof – that is the source code or text itself – is without meaning. If one by “software” refers to the method that is described by the source code, the debate of patentability does make sense. In such instances, the source code of the software may be seen as a description of the algorithm in the same manner as the patent application including the description is a description of the invention. The use of the term “computer-implemented inventions” as found in the EU Commission’s proposal for a directive²⁹ does not

²⁶ Cf. e.g. the 1979-report made by the National Commission on new Technological uses of Copyrighted Works (CONTU), p. 28, (U.S.) and Jüngst, Jan Oliver, *Novelty and Industrial Applicability in Computer Programs in Europe*, NIR 2002.490. According to case law, software was protected by copyright in Scandinavia even before legislation explicitly encompassing software was enacted, cf. e.g. the decision by the City Court of Copenhagen dated 25 October 1985, cf. Edb-retlige Afgørelser 2, Copenhagen 1986, p. 241, and the Swedish High Court decision dated 19 November 1987, cf. NIR 1988.310. Another reason not to be underestimated was the fact that a global regime for copyright protection existed, meaning that protection could easily be implemented.

²⁷ See, e.g. EPO Guidelines C IV 2.3.6.

²⁸ Cf. Lloyd, Ian J., *Information Technology Law*, 3rd ed., London 2000, who at p. 319 notes: “Over the last 20-odd years, the nature of computer programs has changed and expanded, and the division between software and hardware has become a matter of chance as much as one of technology.”

²⁹ Cf. footnote no. 3.

materially change the above or the fact that the directive relates to software-related inventions and consequently the latter term will be used in this article.

5 Patenting Software in Practice – Requirements for Patentability

As noted above, patents on software-related inventions are issued by the EPO.³⁰ Thus, it does not make sense to discuss whether such inventions in general are patentable or not. It might be argued that the practice of the EPO, including that of the Board of Appeal, is not binding upon the national courts. While this is formally correct it should, however, be noted that smaller countries, like the Scandinavian countries, cannot maintain their own practice in this field due to a lack of relevant cases before the courts and that they presumably will follow the EPO practice, as noted by the Swedish court “Regeringsrätten” in its 1990 Philips-decision, stating that it is not possible for a small country like Sweden to maintain its own practice in this field and that the practice of the EPO should be adhered to.³¹ Further, the case law of the EPO has been confirmed by the German “Bundesgerichtshof”,³² which is quite experienced in patent law, and will most likely be followed by other European courts.³³

While copyright protection is available without observing any formalities such as registration, patent protection is based on an application system. For Denmark, Finland and Sweden it is possible to apply for a patent with both the national authorities and the EPO, while patents relating to Iceland and Norway must be applied for with the national patent authorities as these countries have not ratified the EPC. The enforcement and interpretation of granted patents, however, are left exclusively to the national courts and it is primarily this fact that leaves space for legal uncertainty as to the scope of software patents.

It is important to note that this two-tier application system means that the patent authorities of the member states of the EPO cannot when granting patents adhere to practices substantially different from the one applied by the EPO, i.e. use a different interpretation of the provisions for patenting, e.g. software-related inventions. Such differences in the granting procedures would immediately

³⁰ According to Betten, Jürgen, *Patentschutz von Computerprogrammen*, GRUR 1995.775 and Lloyd, Ian J., *Information Technology Law*, 3rd ed., London 2000, p. 321, during the period 1986-1995 in which according to the authors around 10,000 (and not 20,000 as estimated by the EPO) software patents were issued by the EPO, less than 1% of such applications were rejected.

³¹ Cf. NIR 1990.486, and Levin, Marianne, *EPC och nationell patenträtt, särskilt vad gäller datorprogram*, NIR 1991.197. Similarly it is assumed that Norwegian practice will generally adhere to that of the EPO, cf. Sæbø, Jarle Roar, *Patent på datamaskinprogrammer – oppfinnelsesbegrebet*, NIR 2001.351. The same may be assumed with respect to Danish practice.

³² Cf. decision of 17 October 2001 in case X ZB 16/00 “*Zeichenketten*”.

³³ For an example of the urge to follow EPO case law, please refer to Lord Hoffmann’s remarks, cf. reason no. 13 in fine, in the *Biogen*-decision, *Biogen Inc. v Medeva PLC*, [1997] R.P.C. 1, stating that said decision should not be seen as an example of divergence between the jurisprudence of the House of Lords and the EPO.

result in “forum shopping” by the applicants, who would apply with the authorities perceived to be most liberal in their patent granting practice.³⁴

Moreover it is important to note that the inventor’s rights according to the EPC and the Scandinavian patent legislation are granted as per the date of the filing of the patent application with the relevant authority and not on a “first to invent” basis. Apart from the formal requirements for an application and the contents thereof, a number of material requirements as to patentable inventions exist, cf. below.

5.1 *Basic Requirements for Patentability*

The Scandinavian countries have a long history of joint legislation and the present patent legislation of the five countries is based on a common legislative history, i.e. *Nordiske Udredninger 1963:6* (NU 1963:6), which also forms a part of the basis from which the EPC is constructed. Thus, the basic requirements for obtaining a patent are in accordance with the EPC and the legal tradition in the Scandinavian countries. That is, in order to obtain a patent according to EPC Article 51 (1), four criteria must be met, cf. above, 1) there must be an invention, which 2) must be new, which must 3) involve an inventive step and 4) be susceptible of industrial application.³⁵ These criteria, which are identical to those found in the patent legislation of the Scandinavian countries, are treated below under 5.1.1 to 5.1.4.

5.1.1 The patentable invention

While the U.S. Patent Act³⁶ and the Japanese Patent Act³⁷ – directly or indirectly – define an “invention”, neither the EPC nor the national legislation of the Scandinavian countries explicitly defines the term. Attempts made to define the term according to Scandinavian law have been in vain and contemporary writers generally abstain from these attempts and aim only at describing the characteristics of an invention in general terms. Thus, what constitutes an invention has to be decided on a “case by case” basis by the courts, the national and EPO patent granting authorities and the national and EPO Board of Appeal. From a purely scientific point of view, it may seem disappointing that it is not possible to come up with an exact definition of “invention”, but it must be recognised that the technical progress and ongoing innovation prevent this. This

³⁴ According to Sommer, Tine, *Patentering af det humane genom*, UfR 2004B.214, such forum shopping takes place in relation to biotechnological patent applications, which apparently frequently are withdrawn from the Danish patent authorities and then sent to the EPO.

³⁵ Cf. EPC Article 52.

³⁶ Cf. USC Title 35, section 101: “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.”

³⁷ Cf. Section 2, paragraph 1, of Law No. 121 of April 13, 1959, with later amendments: “‘Invention’ in this Law means the highly advanced creation of technical ideas by which a law of nature is utilized.”

fact, however, in combination with the prohibition provisions in EPC Article 52 (2) and (3) makes it even more important to consider what does per nature constitute non-patentable subject-matter, as the absence of a definition means that it is not possible – based entirely on an interpretation *e contrario* to the wording of EPC Article 52 (1) – to determine the precise extent of the prohibition provisions of EPC Article 52 (2) and (3).

Traditionally, for an invention to be patentable under Scandinavian law it must have a technical character, result in a technical effect and be reproducible.³⁸ As the requirement for reproducibility does not, due to the nature of software, constitute any material challenge as to patentability it is not further discussed.³⁹ While the term “technical” is neither found in the EPC⁴⁰ nor in the national patent legislation of the Scandinavian countries, the requirement for “technical character” is derived from legal tradition.⁴¹ Not only is the term not used in legislation but the meaning of the term “technical” is also not defined,⁴² making it difficult to predict whether a software-related invention will be patentable subject-matter or not. This difficulty is not made less by the vague definition of “technical character”, *cf.* the foregoing, and is further accentuated by the requirement by TRIPS Article 27, that patents shall be available for inventions in all fields of technology, presumably indicating that software should be patentable as it belongs to the field of information technology.⁴³

5.1.2 The requirement for industrial applicability

According to EPC Article 57, “An invention shall be considered susceptible of industrial application if it can be made or used in any kind of industry, including agriculture.” The term “susceptible for industrial application” is not defined in detail neither in the EPC nor in Scandinavian patent legislation. In the preparatory works to the latter it is noted that the term shall be interpreted to include not only industry and trade but also agriculture and industry procuring

³⁸ *Cf.* NU 1963:6, p. 96-97, and *e.g.* Stenvik, Are, *Patentrett*, Oslo 1999, p. 115.

³⁹ As noted by Nichols, Kenneth, *Inventing Software*, Westport 1998, p. 27, self-modifying software and the use of distributed computing might challenge this reproducibility. This, however, does at the current state of technology only constitute a problem of theoretical interest.

⁴⁰ The term is, however, used in EPC Rule 27 (1)(b) and Rule 29 (1), *cf.* the *Implementing Regulations of the Convention on the Grant of European Patents*.

⁴¹ *Cf.* NU 1963:6, p. 196-199 with respect to Scandinavian legislation.

⁴² In NU 1963:6 the term is loosely defined as being the opposite of so-called “mental acts” and it is stipulated that the requirement for “technical character” involves the solutions of a task using natural forces and material, *cf.* p. 96-97. The word “technique” is derived from the Greek word “*téchne*” meaning “art” or “handicraft”.

⁴³ *See e.g.* Schiuma, Daniele, *TRIPS and the Exclusion of Software “as such” from Patentability*, IIC 2000.36, arguing that the exclusion clause is contravening TRIPS Article 27. This is, however, in the light of current EPO case law not necessarily the case, *cf. e.g.* Törnroth, Lennarth, *Datorprogram och patentskydd – utvecklingen av svensk rättspraxis i belysning av främst EPO-praxis*, NIR 1999.86.

products made artificially or occurring in nature, including food etc.⁴⁴ In real life, the requirement is interpreted in a manner meaning that only “activities which take place in the private area and are not for industrial purposes” are excluded.⁴⁵ The broad interpretation traditionally applied is further illustrated by the German Patent Act, which speaks of “gewerblich anwendbar”.⁴⁶ It is assumed by Olsson that for an activity to be industrially applicable it must be “an activity [that] is carried out continuously, independently and for financial gain.”⁴⁷ While these characteristics may very well be typical for industry, they cannot form part of the legal requirements for obtaining a patent as it is not a requirement that a patent owner actually actively exploits his patent. Further, such a requirement would prevent the patenting of major ground-breaking inventions, which due to the state of the art cannot at the time of application be employed in real life.⁴⁸ In conclusion, it is not – as is the case for biotechnological inventions, cf. Directive 98/44/EEC, Article 5 (3) – possible simply by the application of the requirement for industrial applicability as this is currently applied in case law, to decide that software as a phenomenon may not be patentable. On the contrary, it is often by way of utilising software that phenomena normally barred from patentability, e.g. business methods, are made industrially applicable, cf. paragraph 4.

5.1.3 The requirement for novelty

According to EPC Article 54 (1), “An invention shall be considered to be new if it does not form part of the state of the art.” This means that for an invention to be patented it must be new in the sense that at the time of the application, the invention has not been described in a manner available to the public enabling someone skilled in the art to implement the invention. According to the EPO Guidelines,⁴⁹ “Novelty exists if there is any difference between the invention and the known art.”⁵⁰ It is sufficient for such a description to have been made public anywhere in the world for it to prevent the granting of a patent based on the lack of novelty. While it may be argued that the requirement for novelty plays little or no role in real life,⁵¹ it has traditionally had greater focus within the EPO due to historic reasons to separate the examination for novelty from the examination for non-obviousness.⁵² Following the latest practice from the Boards, however, the requirement for novelty has lost its importance as the

⁴⁴ Cf. note 180.

⁴⁵ Cf. Lunzer, Ralph, *Singer: The European Patent Convention – Revised English Edition*, London 1995, p. 212, and similar Stenvik, Are, *Patentrett*, Oslo 1999, p. 137.

⁴⁶ Cf. Article 1, paragraph 1.

⁴⁷ Cf. *Patentability and computer software in the USA and Europe*, Göteborg 1996.

⁴⁸ Examples of such inventions may be the electrical bulb, the telephone and the telegraph which were not immediately applicable due to the lack of sufficient infrastructure.

⁴⁹ EPO Guidelines for examination – December 2003.

⁵⁰ Cf. Part C IV 9.1.

⁵¹ Cf. Stenvik, Are, *Patentrett*, Oslo 1999, p. 160.

⁵² See e.g. Törnroth, Lennarth, *Europatentet inför förverkligande*, NIR 1972.335.

deciding factor when determining whether a software-related invention falls within the patentable subject-matter, cf. below 5.1.4.

The historic importance of perceived problems relating to the examination as to the novelty of software-related inventions cannot be overestimated, as these problems are presumably the major reason for the existence of the software exclusion in the EPC. Thus, it was stipulated in the 1966 report made in connection with the then proposed revision of the U.S. Patent Act,⁵³ that the patent authorities could not properly examine patent applications for software because of the lack of classification techniques and requisite search files. Further it was noted that reliable searches would not be feasible or economic due to the tremendous volume of prior art being generated. It is presumably these concerns that are reflected in the PCT, cf. paragraph 3 above, and subsequently in the EPC. While the emergence of software ironically has solved the problems of searching through massive volumes of data, the problems referred to above may have been part of the present legal insecurity as the search for prior art mainly takes place in the knowledge conserved in issued patents, which due to historic reasons do not reflect knowledge pertaining to software – generally assumed to be non-patentable. This may very well have resulted in the granting of software patents which did not meet the requirements for novelty or an inventive step, cf. below.

5.1.4 The requirement for an inventive step

According to EPC Article 56, “An invention shall be considered as involving an inventing step if, having regard to the state of the art, it is not obvious to a person skilled in the art.” The demand for an inventive step has to be viewed in close connection to that of novelty and may be seen as a qualifying demand making certain that the demand for novelty is real and not just a matter of choosing the appropriate wording in the patent application.⁵⁴ According to the latest practice of the EPO, the test for an inventive step has now become decisive when assessing whether an invention is patentable subject-matter, cf. below in paragraph 5.3.

5.2 The Patent Claims

In practice, the question of patentability is decided upon on the basis of the wording of the claims contained in the patent application. The claims are also decisive when determining the scope of the patent protection in infringement disputes.⁵⁵ The format of the patent claims are regulated by EPC Article 84 and EPC Rule 29 and further described in EPO Guidelines C III. The patent claims shall define the subject-matter for which protection is sought in terms of the

⁵³ Cf. footnote no. 11.

⁵⁴ Cf. Koktvedgaard, Mogens, *Lærebog i immaterialret*, 6th ed., DJØF 2002, p. 224.

⁵⁵ Nevertheless, the description and drawings shall be used to interpret the claims, cf. EPC Article 69 (1) in fine.

technical features of the invention. If such technical features are not found, the application should be rejected.⁵⁶

Whenever suitable, a patent claim consists of an introductory descriptive part, which may contain parts of prior art, and of a characterising part, stating the new technical features, which it is desired to protect in combination with the stated prior art. Patent claims are normally directed to one of the following: 1) a product, 2) an apparatus, 3) a method, or 4) a certain use.⁵⁷

Patent claims may be either independent or dependent upon other claims. If an independent claim is not accepted, all dependent claims are made void. The protection conferred by a claim is dependent upon the number of technical features it contains. Generally speaking, one might say that the more technical features, the more narrow the protection and vice versa. Claims that are designed to grant the applicant a wider scope of protection than is merited by the inventor's contribution to the state of the art should be rejected.⁵⁸

In relation to software, the perceived problem lies in the potential issuance of method claims or product type claims incorporating the method, as these might be very broadly formulated, granting a (too) wide protection to the applicant and preventing others from using the patented method. Claims directed to an apparatus will normally be limited by the purpose of said apparatus and are traditionally not viewed as endangering the general use of the methods contained in the software. Claims directed to a certain use of software may be used for obtaining protection in instances where e.g. product type claims are not allowed and are normally limited to the actual use described.

5.3 *The Examination*

The examination procedures with the patent authorities play an important role. Based on the wording of EPC Article 52 (1), the following order of examinations would seem relevant: Firstly, it must be established whether there is an invention, secondly, it must be established whether the invention is susceptible of industrial application, thirdly, it must be assessed whether the invention is known in prior art, and fourthly, it must be established whether the invention includes an inventive step. In practice, these four steps are presumably melting more or less together, even with the EPO.

Examining procedures with the EPO are generally adhering to the so-called "whole contents approach", whereby examination and comparison with prior art are based on the description of the invention in its entirety, i.e., the requirement for technical character is satisfied if there is a technical character found somewhere in the invention.⁵⁹ This allows for an invention to consist of both

⁵⁶ See e.g. T 51/84 *Stockburger/Coded distinctive mark*.

⁵⁷ The four phenomena listed are identical to the possible forms of inventions traditionally recognised in international and Scandinavian patent tradition and the allowable claims.

⁵⁸ This is implied in EPC Articles 83 and 84. See further Schovsbo, Jens, *Immaterialretsaftaler*, DJØF 2001, chapter 8, paragraph 4.2, treating inter alia the *Biogen*-decision.

⁵⁹ Cf. T26/86 *Koch & Sterzel/X-ray apparatus* in which the Board of Appeal disregarded arguments that a point of novelty doctrine or contribution approach should prevail. The

technical and non-technical elements without being rejected on the grounds that the novel feature of the invention lies in a field excluded from patentability, cf. EPC Article 52 (2) and (3). It is in essence this approach that underlies the whole debate of software patenting.⁶⁰

When looking at the examining methods used by the EPO in relation to software-implemented inventions and case law, it is apparent that they have been changing over time. The latest change has taken place with the Board of Appeal's 2000 decision *PBS Partnership/Controlling pension system*⁶¹ (PBS), which is currently the leading case on the examination of software-related inventions.⁶²

In *PBS*, the claimed invention related to inter alia a method of controlling a pension benefits program (claim 1) and an apparatus for controlling a pension benefits system (claim 5). As to claim 1, the Board of Appeal stated that

“All the features of this claim are steps of processing and producing information having purely administrative, actuarial and/or financial character. Processing and producing such information are typical steps of business and economic methods. Thus the invention as claimed does not go beyond a method of doing business as such and, therefore, is excluded from patentability...”.

With regard to the apparatus claim, claim 5, the Board of Appeal concluded that

“An apparatus constituting a psychical entity or concrete product suitable for performing or supporting an economic activity is an invention within the meaning of Article 52 (1) EPC”, but that “In the decision under appeal the closest prior art is identified as the “existing private pension plan” described in the application. The decision furthermore explains that it would not be possible to understand from the application any technical problem or contribution provided by the claimed subject-matter to the prior art. Indeed, the improvement envisaged by the invention according to the application is an essentially economical one, ie lies in the field of economy, which, therefore, cannot contribute to the inventive step. The regime of patentable subject-matter is only entered with programming a computer system for carrying out the invention. The assessment of inventive step has thus to be carried out from the point of view of a software developer or application programmer, as the appropriate person skilled in the art, having the knowledge of the concept and structure of the improved pension benefits system and of the underlying schemes of information processing as set out for example in the present method claims.” Further, that “... the technical features of the

apparatus claimed was a computer-controlled X-ray apparatus, primarily differing from the prior art by the use of novel software controlling the X-ray tubes.

⁶⁰ Before the amendment of the EPO Guidelines that took place in 1985, presumably initiated by the *Vicom*-application and the 1981 U.S. Supreme Court decision *Diamond v. Diehr*, 450 US 175, it was set forth in the Guidelines that claims where the only novel feature was a computer programme were to be rejected as relating to a computer programme as such, cf. EPO Guidelines 1978 C IV 2.

⁶¹ T 931/95.

⁶² Only 1½ year earlier, the Board of Appeal had stipulated in T 619/98 *Edico/Television set* that a point of novelty approach or contribution approach should be applied during examination, meaning that the non-technical features of an invention could not distinguish that invention from prior art.

apparatus claimed are functionally defined precisely those steps of information processing which form part of the knowledge of the skilled person and that the application of computer systems in the economic sector has already been a general phenomenon at the priority date ... of the application, it must be concluded that the claimed subject-matter does not involve an inventive step ...”.

With this argument, the Board of Appeal clearly distinguishes EPO practice from U.S. practice, illustrated by the *State Street*-decision,⁶³ and maintains the demand for technical character as the deciding criterion for determining whether a given subject-matter is patentable.

In its decision, the Board of Appeal further clearly stipulates that the point of novelty approach or contribution approach is no longer valid: “There is no basis in the EPC for distinguishing between “new features” of an invention and features of that invention which are known from the prior art when examining whether the invention concerned may be invention within the meaning of Article 52 (1) EPC. Thus there is no basis in the EPC for applying this so-called contribution approach for this purpose.”⁶⁴

While the Board of Appeal is on the surface very clear in its rejection of the contribution approach, the Board of Appeal does not really discern the use of the method, it rather moves the time of the application of the approach from the examination for novelty to the examination of an inventive step. Thus, the contribution approach still applies, as an invention according to the Board of Appeal must contribute in a “technical manner” to the level of technical knowledge found in prior art. Further it is interesting that following the *PBS*-decision, the EPO Guidelines (December 2003) stipulates⁶⁵ that when examining software-related inventions, the examiner may start by establishing whether the necessary inventive step, cf. the above, is present and not by establishing whether the subject-matter in question is an invention, i.e., has technical character as would be the case for other kinds of inventions.

6 EPO Case law and the Demand for “Technical Character”

It is not an easy task to find a firm line in the decisions made by the Boards of Appeal of the EPO, which decisions are characterised by incongruity. This incongruity may be the result of the fact that each decision is made in relation to the concrete invention in question and that these inventions are differing in kind. It does, however, seem to reflect a certain insecurity amongst the Boards of Appeal themselves as to what practice should be condoned in relation to software patents.⁶⁶ This insecurity is enhanced by the obiter dicta found in

⁶³ Cf. footnote no. 4. According to the *State Street*-decision it was sufficient for patentability that the invention produced a “useful and tangible result”. This was confirmed in the later (1999) decision *AT&T Corp. v. Excel Communications, Inc.*, 175 F. 3d 1352.

⁶⁴ Cf. Reasons 6, paragraph 12.

⁶⁵ Cf. C IV 2.3.6.

⁶⁶ As noted by Laakkonen, Ari, *European and UK Software and Business Method Patents are in a Holding Pattern*, World E-Commerce & IP Report, 2001, Vol. 1, Issue 7, p. 19, this incongruity makes it difficult to amend patent legislation as it conveys uncertainty as to the

several decisions⁶⁷ and is presumably not made smaller by the fact that the Boards of Appeal have repeatedly denied to put the issue before the Enlarged Board of Appeal.⁶⁸

There is, however, no doubt that the one decisive criterion used to distinguish between inventions, that subject to the above criteria being met are patentable and non-patentable subject-matter, is whether or not the phenomenon examined has a “technical character”. So when does a software-related invention have a “technical character”?

EPO case law is very ambiguous on this issue, but based on an analysis of EPO case law, technical character may apparently be achieved in four different ways: 1) the invention produces a technical effect which presumably involves a physical change in a physical object (6.1); 2) the invention solves a technical problem (6.2); 3) the problem solved by the invention requires technical means for its solution (6.3); and 4) it has been a prerequisite for the invention that the inventor has made “technical considerations” and that such considerations are reflected in the claimed subject-matter (6.4). These four variants are treated below.

6.1 Technical Effect

The existence of a technical effect as sufficient means to consider a software-related invention patentable, was first approved of by the EPO Boards of Appeal in the 1986 *Vicom*-decision which is also the first known decision by the Boards of Appeal relating to a software-related invention. The invention related to a computer and a mathematical method for the handling and filtration of digitally stored data representing satellite images. The invention was claimed both as a method and as an apparatus. While the examining division of the EPO refused the patent application on the grounds (1) that the independent method claims (1, 3, 5 and 12) related to mathematical methods, (2) that the dependent method claims (2, 4, 6 and 7) did not encompass the necessary technical means, cf. EPC Rule 29, and (3) that the apparatus claims (8-11) did not fulfil the demand for novelty, cf. EPC Art. 54, the Board of Appeal allowed the patent, though with amended method claims.

Initiated by information given to the applicant by the Board of Appeal, the applicant amended his method claims so that they related to the digital handling of images in the form of two-dimensional data arrays instead of two-dimensional data sets, which were considered to be a mathematical method by the examination authorities.

In its decision, the Board of Appeal noted that the difference between a non-technical mathematical method and a technical process involving the use of a mathematical method is that the latter “is carried out on a psychical entity

present legal position.

⁶⁷ Compare e.g. the statements made in decisions T 164/92 *Bosch/Electronic computer components* and T 204/93 *AT&T/System for generating software code components* that software may never be patented with *IBM/Computer Program Product I and II*.

⁶⁸ Cf. T 26/86 *Koch & Sterzel* and T 931/95 *PBS Partnership/Controlling pension system*.

(which may be a material object but equally an image stored as an electric signal) by some technical means implementing the method and provides as its result a certain change in that entity”,⁶⁹ and “that even if the idea underlying an invention may be considered to reside in a mathematical method a claim directed to a technical process in which the method is used does not seek protection for the mathematical method as such.”⁷⁰ Thus, the amended method claim was accepted and consequently also the apparatus claim with the following remark “it would seem illogical to grant protection for a technical process controlled by a suitably programmed computer but not for the computer itself when set up to execute the control.”⁷¹

It is interesting to note that apart from the fact that a physical change takes place in the data files containing the images, the Board of Appeal does not so much focus on what is the actual effect of the use of the method as on what is the object represented by the data. This approach is found in a number of other decisions focussing on the information content of the data processed and is noteworthy, as it means that the technical character does not so much depend on what is being done as what it is being done to. That is, if the data processed represents numbers or money, the methods involved are mathematical formulae or business methods that cannot be patented, while if the objects represented are physical objects or conditions, e.g. building bricks or information about conditions prevailing in an apparatus, the methods may be patentable.⁷² It should be noted that in both instances, physical change in the data files take place as any manipulation of such files results in new and physically different files. The U.S. case law does not in the same manner differentiate according to which objects are being represented by the data processed, cf. the *State Street*-decision, cf. footnote no. 63.

This fact may be one of the underlying rationales for the landmark decisions *IBM/Computer program product I*⁷³ and *II*,⁷⁴ which further qualified the requirement for technical character and are currently the leading EPO case law relating to software-related patents.

According to the two almost identical decisions which were made public in March 1999, claims relating to instructions to a computer, whether on a carrier such as a CD-ROM or on their own – so-called “computer programme product” claims – are acceptable if the existence of a so-called “further technical effect” is demonstrated. Further according to the Board of Appeal it is sufficient for the effect to be potential, i.e., that the effect will show when the computer programme is loaded onto a computer.⁷⁵

⁶⁹ Cf. Reasons 5.

⁷⁰ Cf. Reasons 6.

⁷¹ Cf. Reasons 16.

⁷² This is for instance illustrated by T 115/85 *IBM/Computer related invention (visual indications)*, T 71/91 *IBM/Electronic document distribution network with a uniform datastream*, T 164/92 *Bosch/Electronic computer components* and the Boards of Appeal’s statements in T 769/92 *Sohei/General purpose management system*, cf. below.

⁷³ T 1173/97.

⁷⁴ T 935/97.

⁷⁵ Thus the Board of Appeal went further than the then current U.S.-case law, cf. *In re*

In its decision, the Board of Appeal noted that the purpose of EPC Article 52 (2) and (3) was only to stop non-technical software from being patented⁷⁶ and that “programs for computers must be considered as patentable inventions when they have a technical character.”⁷⁷ Further, the Board of Appeal noted that all software due to its interaction with hardware has a sort of technical character, but that this is not enough. There has to be found some “further effects deriving from the execution (by the hardware) of the instructions given by the computer program. Where said further effects have a technical character or they cause the software to solve a technical problem, an invention which brings about such an effect may be considered an invention which can, in principle, be the subject-matter of a patent.”⁷⁸

With the introduction of the requirement for a further technical effect, the Board of Appeal institutes a special requirement for software-related inventions unknown from any other type of invention. The perceived need for this requirement is due to the Board of Appeal’s acceptance that software in terms of electrical impulses has a technical character and that, for the exclusion clause to make sense, something more is needed for software to be patentable. The requirement does, however, not solve the problems relating to software patents, as any new technical effect will presumably constitute a further technical effect as it is not a “common feature of all ... programs”.⁷⁹ The decision, however, illustrates the trouble persisting when trying to fit the exclusion relating to software into practical life. Another solution which may have eased the trouble for the Board of Appeal would have been to take the approach later followed in the *PBS*-decision, cf. above, as this would have saved the Board of Appeal from the introduction of the further technical effect and allowed the Board of Appeal to focus on whether the requirement for an inventive step was met.

It is possible to differentiate between an external and an internal technical effect, however, this distinction does not seem to have any legal bearing following the 1987 *Koch & Sterzel*-decision,⁸⁰ which stated that when the presence of a technical effect was established, it did not matter where the technical effect occurred. The distinction may, however, be useful when examining a patent application, as when the existence of an external technical effect is established it is no longer required to make additional examination as to whether the subject-matter in question constitutes patentable subject-matter.

That the presence of a technical effect was the deciding factor in *Vicom* is confirmed by the same Board of Appeal’s later decision in T 121/85 *IBM/Automatic spelling checking*⁸¹ and was further deciding in the cases T 28/86 *Koch & Sterzel/X-ray apparatus*, T 163/85 *BBC/Colour television signal*, T 110/90 *IBM/Editable document form*, T 236/91 *Texas Instruments/Menu-based*

Beauregard, 53 F 3d 1583, accepting claims (so-called *Beauregard*-claims) relating to software on a media.

⁷⁶ Cf. Reasons 5.

⁷⁷ Cf. Reasons 5.3.

⁷⁸ Cf. Reasons 6.4.

⁷⁹ Cf. Reasons 6.

⁸⁰ T 26/86.

⁸¹ Cf. Reasons 5.5 in fine.

natural language understanding system and in T 164/92 *Bosch/Electronic computer components*. The potential technical effect was further decided in T 1194/97 *Philips/Data structure product* in which a so-called “picture access data structure” was recognised as patentable.

6.2 *The Invention Solves a Technical Problem*

That the solving of a technical problem was sufficient to convey an invention with technical character was first established in the 1988 decision *IBM/Computer-related invention*.⁸² The invention related to a method for displaying one of a set of predetermined messages, each such message indicating specific events occurring in hardware. While the examining division refused the application on the grounds that the sole contribution to the art resided in a computer programme, the Board of Appeal took the view that giving visual indications automatically about conditions prevailing in an apparatus or a system is basically a technical problem, and that a claim directed to the use of a computer programme in the solution of a technical problem cannot be regarded as seeking protection for the programme as such. Consequently, the application was allowed.

6.3 *The Problem Solved by the Invention Requires Technical Means for its Solution*

According to the interpretation of then current case law by the Board of Appeal in its 1993 decision *IBM/Simulation of computer program external interfaces*,⁸³ the needed technical character may be found in the means constituting the solution of an underlying problem solved by the invention.⁸⁴ The actual application was rejected as it was found that there was no contribution to the art.

6.4 *“Technical Considerations”*

In its 1994 decision, *Sohei/General purpose management system*,⁸⁵ the Board of Appeal accepted that so-called “technical considerations” are sufficient to convey technical character to an invention. By technical considerations, the Board of Appeal referred to the fact that it had been necessary for the inventor to make technical considerations in order to implement the invention. The actual invention related to a general purpose management system that could be used for “financial”, “inventory”, “personnel” and “construction” managements, inter alia. The claims, however, related only to the area of “at least financial and inventory management”. The novel features of the invention related to 1) the

⁸² T 115/85.

⁸³ T 833/91.

⁸⁴ Cf. Reasons 3.1 in fine.

⁸⁵ Cf. T 769/92.

processing of data by way of a so-called “single transfer slip”, i.e. a special on-screen input interface, and 2) the subsequent processing of the input by way of use of special purpose system, containing, inter alia, a “journalised daybook” and a number of other files containing data. The invention was based on the assumption that the administration mentioned normally in prior art was based on the use of a number of different computer systems using incompatible data formats and requiring the user to enter the data relevant for each system on each system, i.e., to enter the same data more than once to perform the administration. The invention allowed the user to input the data only once via the single transfer slip, the data were then subsequently to be stored in the file system of the invention, and the invention then allowed the said programs to communicate with each other. The independent claims related to both a computer system (apparatus) and a “method for operating a general-purpose computer”.

The application was rejected by the examining division on the grounds that it differed only from prior art by features involving a computer programme and presentation of information, and that no contribution to the art was discernible.⁸⁶

During the appeal procedure, the appellant argued that the question of whether the invention had technical character should be decided upon without regard to the prior art and the issues of novelty and an inventive step. Further, the appellant argued that the existence of technical considerations was sufficient to demonstrate the existence of technical character in the invention and that such technical character was present in all instances where the implementation of a method necessitated a solution different from the one that would be used by a person solving the same problem. Finally, the appellant argued that the computer software prohibition, cf. EPC Article 52 (2)(c) and (3), was only intended to exclude programme listings.

The Board of Appeal set out by deciding that the issue of patentability should be decided jointly for the two claims and without prejudice to the extent of protection that a patent might confer to the applicant. The Board of Appeal further noted that the types of management claimed were outside the scope of patents, but accepted that these types were only meant to be examples of the possible application of the invention which could also be used for construction management, inter alia. According to the Board of Appeal, the decisive factor was that the significance of the data input was different depending on the kind of management that was performed.

Further, the Board of Appeal noted that, according to the claims, the functional features of the invention were implemented by the use of software which was “excluded as such from patentability, like other (mostly non-technical) subject-matter or activities in Article 52 (2) ...”, but that, according to practice, an invention may consist of both technical and non-technical elements if a contribution to the art is found by way of solving a technical problem or if a technical effect is found. According to the Board of Appeal, the same applied if, as in the present case, cf. below, the invention needed technical considerations as to the particulars of its implementation and that “[t]he very need for such technical considerations implies the occurrence of an (at least implicit) technical

⁸⁶ Cf. Summary of facts and submissions, I.

problem to be solved (Rule 27 EPC) and (at least implicit) technical features (Rule 29 EPC) solving that technical problem.”⁸⁷

Relating to the actual application, the Board of Appeal applied a so-called “generalised approach” and disregarded the purpose of the application (general purpose management) and stated that the use of the five data files claimed (journalised daybook, item master, commodity master, journalised daybook accumulation and inventory files) as means to allow a computer’s central processing unit to perform five different functions, clearly required technical considerations.⁸⁸ Further, the Board of Appeal noted that the invention could not be reduced to “presentation of information as such” as the actual on-screen presentation (the single transfer slip) “is not governed only by the particular meaning of each of the information items displayed. Rather, it also implies that by it, in effect, two kinds of systems (here: management systems) having different purposes and implying independent activities (here: management) are combined by a common input device (embracing the unit input, the display unit and the journalised daybook file), allowing each of type entered items necessary for use in one of the said systems ... to be used, if required, also in the other ... and vice versa.”⁸⁹

Further, the invention could not be reduced to “mere programming as such” as “Mere programming as such would, in the board’s view, also be excluded from patentability by virtue of the fact, that it is an activity, which essentially involves mental acts excluded an, in addition, only results in computer programs which are also excluded ... However, the implementation in the claimed system and by the claimed method, of the said “interface” in the form of said “transfer slip” is not merely an act of programming but rather concerns a stage of activities involving technical considerations to be carried out before programming can start.”⁹⁰ Finally, the Board of Appeal found that the invention involved a technical contribution “to the (computer) art”.⁹¹

While the Sohei-decision is not easy to understand from the decision published by the EPO alone, the granted patent⁹² and a number of articles⁹³ by Betten, who represented the appellant, give further guidance as to the character of the invention. According to Betten, the Board of Appeal found that the exchange of data was one among more technical effects to be present. Viewed in that context, the decision may be regarded as being in line with previous decisions, stating that the fact that the information exchanged contains more than just knowledge, i.e., technical information about data formats etc., solves a technical problem.⁹⁴ When compared to the *Vicom*-decision, cf. above, it is

⁸⁷ Cf. Reasons 3.3, paragraphs 3 and 4.

⁸⁸ Cf. Reasons 3.6, paragraph 1.

⁸⁹ Cf. Reasons 3.7, paragraph 4.

⁹⁰ Cf. Reasons 3.7, paragraph 5.

⁹¹ Cf. Reasons 3.8 in fine and 3.10.

⁹² See EP 0 209 907.

⁹³ See e.g. Betten, Jürgen, *European Viewpoint of IP Patentability*, Les Nouvelles, March 2000, p. 25.

⁹⁴ See T 6/83 *IBM/Data processor network* and T 110/90 *IBM/Editable document form* which may indicate this.

interesting to note that the very fact that the *Sohei*-invention can be used to process data representing physical objects is sufficient to convince the Board of Appeal that the method claimed had the required technical character. In that sense, the *Sohei*-decision may be seen as an indicator that any method which may be equally applicable for processing data representing numbers, monies or physical objects may be patentable.

6.5 Summary on the Requirement for “Technical Character”

As it should be demonstrated by the above, the term “technical character” is not an easy one to define. The task is not made easier by the arguments found in the case law of the Boards of Appeal, as these arguments are often incoherent and illogical when viewed in the light of each other. Thus, it seems that the above four ways of gaining technical character is basically one and the same relating to the solution of a technical problem. If a technical problem is solved, a technical effect is required, i.e. the solution. Any technical effect must per definition be provided by way of technical means which must be arranged according to preceding technical considerations.⁹⁵ Thus, the question of whether there is an invention may be reduced to the issue of whether a technical problem is solved. Such line of reasoning would result in a greater clarity in the decisions by the Boards of Appeal and would make case law easier accessible and contribute to a higher degree of legal certainty – to the benefit of patent owners, their competitors alike and society at large. Further such an approach is in line with the so-called “problem and solution approach” applied by the EPO when assessing the inventive step, cf. paragraph 5.3 above.⁹⁶

7 Is an Exclusion Clause as to Software Patents Needed?

Based on the above it may be concluded that, according to the current practice of the EPO, the software exclusion is virtually without relevance. Thus, the exclusion according to the EPO only bans non-technical software from patenting. Following the *IBM/Computer program product I* and *II*-decisions, allowing claims directed to the software itself and nothing else and the acceptance that software has technical character, it seems that the exclusion has become redundant. It is, however, questionable whether the prohibition provision has ever been necessary or – except from the rigorous position taken in EPO Guidelines 1978 – has had any real effect on the granting practice. In this connection it is interesting to note that Switzerland – which has been a member of the EPO from the beginning – has never found it necessary to implement provisions similar to Article 52 (2) and (3) in its patent legislation, cf. Article 1

⁹⁵ Westling, Carl, *Patent på datorprogram och affärsmetoder – tillika en kommentar til EG-kommissionens förslag till direktiv för datorprogramrelaterede uppfinningars patenterbarhet*, NIR 2002.534, interprets technical character in a similar manner, cf. p. 538 of his article.

⁹⁶ Cf. EPO Guidelines C IV 9.5.

of the Swiss Patent Act. Thus it might be argued that the legal position is the same, with or without the software exclusion clause.

Accordingly, the EPO suggested the prohibition be removed at the diplomatic conference revising the EPO, which took place from 20 to 29 November 2000. Originally, it was suggested by the President of the EPO that Article 52 (2) and (3) be deleted. This proposal, however, was amended by the EPO Committee on Patent Law which approved of the deletion of the prohibition relating to “programs for computers”, cf. Article 52 (2) (c) in fine, only. Surprisingly the proposal was not accepted by the delegates of the conference and the Chairman of the Administrative Council of the EPO was forced to include the following in his closing speech for the conference:

“First, I should point out that the Conference agreed not to delete computer programs from the list of non-patentable inventions. For the meantime, the existing legal position therefore remains unchanged. The Conference's decision took account of the process of consultation on the future of legal protection in this field, and in no way challenges the existing practice of the Office and its boards of appeal, or that of national patent authorities and courts. As before, computer-implemented inventions can be patented if they involve a new and inventive technical contribution to the state of the art. Technical solutions for use in data processing or for carrying out methods of doing business therefore remain patentable. This follows from the concept of invention itself, which draws a clear distinction between technical solutions and non-technical methods. On this basis, patents cannot be granted for computer programs or business methods which are not of a technical nature.”

Thus, the EPO had to abstain from its attempt to remove the prohibition relating to software. Following the capsized attempt by the EPO, the Commission of the European Communities published its long awaited proposal for a directive on the patentability of “computer-implemented inventions” in 2002.⁹⁷ According to the proposal, the purpose of the directive was first and foremost to establish legal certainty within the field of patenting computer-implemented inventions and to harmonise national patent laws and make the requirements for patentability of software more transparent.

According to the original proposal, cf. Article 5, it was suggested that the possibility for claiming software as a computer programme product on a carrier or on its own, cf. the *IBM/Computer program product I and II*-decisions, should be removed, and that only claims involving a computer or a network or another programmed apparatus should be allowed. This and other facts spurned a large number of protests resulting in an amended directive proposal being in accordance with the EPO case law.⁹⁸ The proposal was then discussed in the EU Parliament which proposed a large number of amendments including amendments pertaining not only to the patentability of software but to the patent system as a whole. Following the very radical proposal – not reflecting current EPO case law – by the EU Parliament, the presidency of the EU has come up

⁹⁷ COM (2002) 92 final, cf. footnote no. 3.

⁹⁸ See press release MEMO/02/249.

with a compromise proposal,⁹⁹ adhering to EPO practice and to be given a second reading in the EU Parliament following its reconvention in September 2004.¹⁰⁰ Since the proposal is not finally passed, it is not feasible to treat the current proposal in detail. However, it is relevant with a remark as to the initial direction taken by the EU Commission and the EU Parliament, according to which software could not be claimed as a product in itself but only in combination with a computer, a computer network etc., cf. below.

While it may be arguable whether a need for harmonisation exists or whether is the right time for such harmonisation, in my view some form of legislation is needed in order to remove the current legal insecurity, imagined or not. Thus, if it is accepted that something has to be done, there seems to be two alternatives, one relating to the granting of patents and another limiting the scope of protection for software patents. First, however, it should be noted that the demand for “technical character” – however vague this term might be¹⁰¹ – should be maintained as the decisive criterion when determining if a subject-matter is patentable.

An attempt to prohibit the patenting of software will probably not be successful, *inter alia* because software has the sufficient “technical character” to meet the traditional requirements for being an invention and thus it will not be possible to enforce such prohibition, as patent applicants will be able to circumvent it by formulating their claims in the appropriate manner. Further, such a line of action would be discriminating between inventions based on the chosen form of implementation only and not borne out of reasoning as to what is patentable, i.e., what constitutes an invention, wherefore such an approach should best be avoided until the need is justified. Should such an approach be chosen, it is important to note that without a definition of “software” the prohibition will be ineffective, as clearly demonstrated by the past 20 years of EPO case law. Due to the ever changing technology and the concerns as to discrimination above, this approach is in my view not feasible.

The above concerns are applicable to all of the prohibited subject-matter in EPC Article 52 (2) and consequently, this article and Article 52 (3) should in my view be relinquished, enabling the debate as to the patentability to return the discussion of whether the classical requirements of patentability are met instead of subtle and never-ending discussions as to the interpretation of said provisions.

Another alternative related to both the granting of patents and the subsequent scope of protection conferred, is to rule out certain types of claims, e.g. product type claims, as initially suggested by the EU Commission. Such an approach will be based on the assumption that software may constitute an invention but shall not have the same scope of protection as other types of inventions. It is, however, in my view difficult to justify that the scope of protection for software patents should be limited in this way, i.e., that a patent owner is not allowed to enforce his rights directly against companies importing the protected software on a media or via e.g. the Internet, but is forced to await the actual use of the

⁹⁹ Cf. doc. 5570/04 dated 29 January 2004.

¹⁰⁰ Cf. EU Commission doc. IP/04/659 of 18 May 2004.

¹⁰¹ See e.g. the criticism made by Mads Bryde Andersen in *IT-retten*, Copenhagen 2001, p. 441-442.

software, which presumably takes place among his own potential customers. Apart from this it should be noted that the inclusion of hardware in the claims, does not necessarily in real life limit the scope of protection in a feasible manner as assumed by the EU Commission as the hardware features included in the claims will presumably be e.g. “storage means” and “processing means”, i.e. features which are common and indispensable in all known computers. Thus, such an approach will not limit the scope of protection for software patents which will be established according to the so-called doctrine of equivalence, cf. EPC Article 69, but only the remedies available to a patent owner when enforcing his rights. Again, such discrimination is in my view unwarranted and should best be avoided.

While it is not feasible to completely rule out product type claims in general, it may be expedient to limit the scope of protection in other ways. One way which is readily available is to apply what could be called the “merit”-doctrine, namely that patent granting authorities make sure that the claims accepted are without doubt merited by the applicants contribution to the art.¹⁰² Such an approach would place a bigger burden on the applicant to justify his claims, but this is in my view justified in order to avoid unfounded claims. Also, the approach would be more demanding on the patent granting authorities which would not – as in the *Sohei*-decision – be able to disregard the matter of protection conferred when granting patents. It might be argued that this doctrine is applied already, but one way to harmonise the application might be to legislate on the use in order to have claims evenly examined throughout Europe. An example of such approach is found in the proposed EU directive harmonising software patents, as it has been deemed feasible to relate to the reverse engineering-clause of the software copyright directive, cf. 91/250/EEC, Article 6. Thus, Article 6 of the proposed directive stipulates that the rights conferred by the copyright directive shall not be affected by the directive harmonising the patentability of software, or in other words, a patent owner cannot by use of his patent prevent the entities mentioned in the copyright directive Article 6 from performing the acts allowed according to that article, if the aim is to produce an interoperable programme. A similar approach could be used in other instances where a potential abuse of the rights conferred by software patents might seem likely. Further, it might be considered to apply a solution similar to that found in the EU biotech-directive,¹⁰³ whereby the applicant must disclose the industrial application of his invention. However, due to the nature of computer programmes and the interpretation of “industrial applicability”, cf. above, this may not be of material importance to software patents. Approaches of this type would be in line with patent law in general and would not discriminate against software inventors and should therefore in my view be preferred.

¹⁰² Cf. the reasoning of Lord Hoffman in the *Biogen*-decision referring to *O’Reilly v. Morse* (1854) 56 US and *British United Shoe Machinery Co Ltd v Simon Collier Ltd* (1908) [1926] R.P.C. 21. A similar approach is taken in the U.S. 1999-decision *AT&T Corp. v. Excel Communications, Inc.* 175 F. 3rd. 1352 in which the Federal Circuit Court of Appeal notes that the claims put forward do not pre-empt others from using the mathematical principle (the Boolean principle) incorporated in the method claim.

¹⁰³ Cf. Directive 98/44/EC, cf. Article 5, paragraph 3.

As it cannot be ruled out that the rights conferred by the patent system – or for that matter any intellectual rights regime – might have unwanted effects, e.g. impeding innovation, or might be abused by the right holders – the discussion about such effects should relate to the patent legislation in general and not only software-related inventions, while abuse until such time as legislation may be amended must be remedied by competition law, e.g. Article 82 of the EC treaty.¹⁰⁴ This approach may not be ideal but is in my view the only feasible approach in order to preserve stability and legal security in patent legislation.

8 Back on the Track – Concluding Remarks

As stipulated above, software patents are issued on a regular basis by the EPO and such patents are recognised by national courts. Thus, the starting point of all debate on this topic should be the acceptance that software patents are currently allowed. Further, it should be asked why software inventions should be discriminated against compared to other technological phenomena, i.e., why software inventors deserve less protection for their inventions than hardware inventors,¹⁰⁵ and it should be noted that with the current requirements for patentability it is presumably not possible to rule out software as patentable subject-matter. Any attempt to do so will be circumvented by the applicants “hiding” the software-related inventions in their claim language. If a plausible reason can be found for such discrimination, e.g. that the traditional rights conferred by the patent system do not harmonise with the need of the so-called information society, it should be considered whether the problems persisting may be dealt with in the existing patent legislation or whether the patent legislation in general has become inadequate or obsolete and consequently should be radically changed.

While considerations as the above take time and should be based on thorough investigations into the substance of software patents and not unfounded political reasoning, there is a need for instant action to remove the current legal insecurity. In that light, the proposal put forward by the EU Commission and revised by the EU Parliament and the current EU presidency may be the adequate tool while not the ideal means to ensure short-term legal security, as a directive would leave questions of interpretation to the EC Court which hopefully would be able to ensure true harmonisation within the EU member states and effectively the EPO member states.

In the long term perspective, a viable solution will presumably not be found without co-operating on an international level, e.g. through WIPO or WTO, as national and even regional legislation, e.g. in the EU, will not remove existing barriers for a fair competition among software developers and their customers.

¹⁰⁴ Cf. e.g. the IMS Health-decision of 29 April 2004 by the European Court of Justice (EPJ) (Case C-418/01). The application of such rules is, however, not without problems as noted by Bruno LeBrun in his commentary to the general advocates’ proposal for a decision, cf. EIPR 2004.84.

¹⁰⁵ Cf. e.g. Riis, Thomas, in *Blume (ed.) – Immaterialretlig beskyttelse af IT-produkter*, Copenhagen 1998, p. 169.

Such co-operation may be aimed at prohibiting the patenting of certain phenomena but with the current trends, this does not seem likely or, given the never ending technological progress, may not even be possible. Another alternative could be to focus on the quality of issued patents and the rights conferred by the patents, i.e., to ensure that patents are only granted when the inventor has contributed materially to the prior art and to prevent the abuse of patent rights, e.g. by allowing certain “fair uses” of inventions, maybe against payment of a reasonable royalty.

No matter what the outcome of such discussions is, two things are certain: The debate over software patents will be continuing over the years to come and a balanced solution taking into account both the need for protection and the need for effective competition is not easily found. While the discussion may be of great importance, the risk that the time and effort used on this is ill spent exists, as it may not be the patentability of software that poses the greatest threat to free competition among software developers. Thus, recent measures in this field seem to be the patenting of so-called data structure products or similar¹⁰⁶ – in other words – file formats such as the XML-format, which may – depending on market positions – effectively grant the proprietors of such patents de facto monopolies preventing others from entering the market for certain application software, e.g. word processors, spread sheets etc.

¹⁰⁶ Cf. T 1194/97 *Philips/Data structure product* and the similar decision T 93/99 *Sony/Data recording and reproducing methods*.