

Software Patents

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1 Introduction¹

In every society, computer technology plays an increasingly important role. The degree of its penetration into different areas of our lives obviously varies between nations and individuals. Nevertheless, the technology has a major impact not only on business but also on private surroundings.

Computers need instructions to operate. There are various types of instructions, but they all need to be incorporated into a computer or a similar apparatus. They are often distributed on media such as CD-ROMs or online. These instructions are so-called software or computer programs.

Although software may be very expensive to create, it is often possible to reproduce software easily and at very low costs. It has therefore been deemed appropriate for society to offer some kind of intellectual property (IP) protection against the unauthorized copying and use, to the creators and producers of this software, so that it will be possible for them to recoup their investments. Historically, the envisioned protection system for software is copyright protection.

The commercial value of software is often dependent on its function or concept, executed through its expressions in computer language. Copyright is a protection for the literal expressions in the form of source code or object code. However, copyright does not protect the concept or function of the software. The creators and producers of software have instead turned to the patent system in order to protect such aspects of software that have technical functions.

Some patent systems, e.g. the European system, expressly excludes computer programs and business methods from patentability. Many proponents of software patent protection claim that this specific exclusion has led to legal uncertainty, which also puts Europe at a competitive disadvantage with respect to the United States (U.S.) and Japan, where no such exclusion exists.

The problems with software patents are several. Many people consider that patent protection of software inhibits the competition and development of software through open source systems. The special characteristics of software production such as cumulative, sequential development and re-use of others work and the need to preserve interoperability between programs, systems and network components will not benefit from the strong commercial protection that a patent confers on the inventor.

In addition to the software patent issues, the patenting of business methods has proven to be an equally difficult task. Most of these business methods are implemented by computers, and many of them relate to methods of doing business on-line. Thus, the question of business method patents is today an integral part of the patent/software dichotomy. Their abstract nature further complicates the legal picture, as mental processes are generally not patentable in any patent system. The relation between the abstract method and the computer/software is one of the legal problems that the patent systems are facing

¹ The author would like to thank Stanley Greenstein, lecturer at Stockholm University, for his generous help with proofreading. Any mistakes or omissions are the sole responsibility of the author.

today, in addition to the fundamental balance between the incentives to innovate and the anti-competitive effects of IP.

The purpose of this chapter is to give an overview of the main issues in regard to software patenting in the 21st century. The focus is on the question of patentability of software, since this is the area which has caused the most problems for patent offices and courts. The main systems of concern are the European and U.S. patent systems. The chapter begins with a presentation of the concept of software in section 2, followed by section 3 with a presentation of IP and patents and the international legal context as well as the European and U.S. patent systems. In section 4 the debate regarding the patent system as a proper protection system for software is discussed. Section 5 outlines the international patent rules pertaining to software which are contained in the TRIPS agreement. Section 6 concentrates on the European approach to software and business methods' patentability, while Section 7 explores the corresponding U.S. approach. Finally there are some brief final words in Section 8.

2 What is Software?

2.1 Software

A computer program will generally exist in two forms: the source code form and the object code form. The source code is a computer program in the form written by a programmer in a specific programming language. The object code is a computer program converted into the form in which a computer would run it (binary codes – the machine language). Some examples of software are:

- Operating systems, e.g. Microsoft Windows and Linux. The operating system is a computer program which organizes all of the other computer programs.
- General software for daily use, e.g. web browsers, word processing, software for making presentations and spreadsheets etc.
- Specialized software for different sectors: financial, design, statisticians, etc., and
- Web server software.²

There have been several attempts to try and define software and computer programs respectively. The legal definition usually differs from the linguistic and practical perspectives.

The Britannica definition of software is:

[T]he entire set of programs, procedures, and routines associated with the operation of a computer system, including the operating system.³

2 IPR Helpdesk Software Copyright “[www.ipr-helpdesk.org/documents/software Copyright_0000001105_00.xml.html#N20053](http://www.ipr-helpdesk.org/documents/software%20Copyright_0000001105_00.xml.html#N20053)” (21 May 2010).

3 Definition from Encyclopedia Britannica, “www.britannica.com/” (28 May 2010).

According to this definition, software has specific features which are differentiated from the hardware and the physical components of a computer system. It is evident that the term software covers much more than a pure computer program.

An early attempt to define software for legal purposes was made by the World Intellectual Property Organization in 1978:

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.⁴

A more recent statement was made by the EPO president Alison Brimelow in 2008. A computer program was defined as ‘a series of steps (instructions) which will be carried out by the computer when the program is executed’.⁵ A computer was understood to include ‘not only devices which are generally thought of as such, for example desktop PCs, but any programmable apparatus (such as a mobile phone or an embedded processor)’.⁶ The term computer program was held to be synonymous with software.⁷

The legal definitions are based on the view of the computer program as a set of instructions. This point of view is in conformity with the IP approach on software being a literary work, meriting copyright protection. When discussing the patentability of software, however, it is usually the computer program that is in focus. Further components such as program descriptions, accompanying material etc. have usually no implications for the patentability questions.⁸ Both of the terms software and computer program will nevertheless be used synonymously throughout the chapter.

2.2 *Business Methods*

The term ‘business method’ is not precisely defined in any jurisdiction, but a general attempt to define the concept is as ‘a method of operating any aspect of an economic enterprise’.⁹ This definition typically encompasses trading, transacting, finance, resource management, marketing and customer service.

4 WIPO Model Provisions on the protection of computer software, Geneva 1978.

5 Referral under Art. 112(1)(b) EPO by EPO President Alison Brimelow, 23 October 2008, p. 3.

6 *Ibid.*

7 *Ibid.*

8 Haase, Heiko, Weyand, Joachim, *Patenting computer programs: new challenges*, IIC 2005, 36(6) 647, p. 647.

9 ACIP – Report on a Review of the Patenting of Business Systems, September 2003, p. 1.

3 Intellectual Property Rights

3.1 *The International Legal Framework*

Intellectual property rights (IPR) protect various kinds of intellectual innovations and creative expressions. The legal domain covers areas such as copyright, design rights, trademarks, patents, plant variety rights and trade secrets. The term ‘intellectual property’ denotes a right to immaterial property, which is different from material property. The ownership of IPR covers technical ideas, forms, individual expressions and other kinds of immaterial values. IP may well have to be integrated into material objects. For example, a technical idea may take the form of a machine or a chemical compound.

The legal domain of IPR has been object to extensive international harmonization already since the late 19th century. The Paris Convention for the protection of industrial property established international standards for patent protection in 1883, and in the field of copyright the Berne Convention on the protection of literary and artistic works was concluded in 1886. In recent years the field of IP has been renewed in an international trade context via the establishment of the World Trade Organization (WTO) and the 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The Patent Cooperation Treaty (PCT) has established an international search and examination procedure.

The WTO is an international organization dealing with the global rules of trade between states. At the heart of the WTO system are the WTO’s agreements, negotiated and signed by a large majority of the world’s trading nations. Ratification of the agreements is a prerequisite for WTO membership. If disputes occur, they are tried within WTO’s dispute settlement process where the focus is on interpreting the agreements and commitments, and how to ensure that countries’ trade policies conform to them. The WTO has nearly 150 member states.

The international TRIPS agreement is one of the WTO agreements, negotiated and enacted in 1994. Through TRIPS, IP law is today a part of international trade law. States that do not adhere to the minimum level of protection required by TRIPS will be barred from membership, or, if already members, may face trade sanctions. The standard of the minimum level of IP protection in TRIPS is in level with the IP systems in the industrialized nations, thereby causing challenges for the states which have a lower development rate both technically and economically.¹⁰

Many critical voices are raised from and on behalf of developing countries. The ownership of exclusive rights is to a large extent concentrated in the hands of large international corporations, which may cause barriers for technology

10 Art. 7 of TRIPS contains the objectives of the treaty: ‘The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.’ These objectives have proven difficult to fulfil, and the difference in protection standards and enforcement between industrialized and developing nations is still large.

transfer, cost-effective pharmaceuticals, inexpensive software and telecom equipment – which are integral to a raised standard of living.¹¹ Other debates focus on the allocation of resources between creators and users of IP protected achievements.

3.2 *What is a Patent?*

A patent is an exclusive right to commercially use an invention. The right belongs to the inventor or his or her successor in title. The inventor is given a time-limited exclusive right to exclude others from using the invention. The patent right consists of the exclusive rights of making, using, offering for sale, selling, or importing for these purposes a patented invention.

To be granted a patent, there must be an invention. The concept of invention is functioning as a threshold test, excluding subject matter that is not patent eligible, e.g. abstract ideas or mathematical formulae. The invention threshold is judged differently in various countries. An invention must furthermore fulfill the criteria of novelty, inventive step/non-obviousness and industrial applicability/utility. These requirements are nearly universally recognized but their application may differ between countries. *Novelty* implies that the invention must be new compared to the state of the art or the prior art, meaning that it must differ from what is already publicly known. *Inventive step* or *non-obviousness* implies some kind of degree of inventiveness on behalf of the invention. This criterion indicates that a patent should never be granted to scarcely innovative or trivial subject matter, but only to true inventions that brings technology forward. The notion of *industrial applicability* or *utility* means that the invention must be able to be used in practice, i.e. be useful. The invention must also be *sufficiently disclosed* or *described*, which means that there must be enough information in the application so that an expert (the person skilled in the art) can understand the invention and its function.

A patent application usually consists of a description of the invention, claims, drawings (if necessary) and an abstract. The invention which is protected by a patent is described in the form of patent claims, which define the invention. An invention can generally be protected as a *product*, *process/method*, or *use* of a product or process/method. It is an internationally recognized principle that the claims shall define the matter for which protection is sought. The claims are therefore of major importance in patent law. The scope of protection of a patent is to a large extent dependant on the formulation of the claim(s).

The patent is a strong commercial exclusive right. Where the subject matter of a patent is a product, the patent holder is entitled to prevent third parties, not having the owner's consent, from the acts of making, using, offering for sale, selling, or importing for these purposes that product. Where the subject matter of a patent is a process, the patent holder may prevent third parties not having the owner's consent from using the process, and from the acts of using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process.¹²

11 Domeij, Bengt, *Patenträtt*, Iustus Förlag, Uppsala 2007, pp. 13-15.

12 Art. 28 TRIPS.

A patent right is a registered right, which is only granted after a formal application and examination procedure. To receive a patent right, the inventor needs to file a patent application to a patent office. Patent rights are always *territorial*, which means that they are only valid within the country that has granted the patent in question. If patent protection is desired in several countries, it is necessary to file applications to every national patent office. The PCT has established a formal system which facilitates international patent applications, but the final material decision on the grant or refusal of a patent is always a matter for national (or in some cases regional) patent offices. Thus, there is no such thing as an international patent or international patent office.

Some regional patent systems have been created for the purposes of international cooperation and to facilitate patent applicants who require patent protection in several countries. In Europe, the European Patent Organisation grants patent which are valid in most of the European states. Other regional patent systems in the world are e.g. the Organisation Africaine de la Propriété Intellectuelle commonly known as OAPI or the African Regional Industrial Property Organisation commonly known as ARIPO.

3.3 *The European Patent System*

European patent cooperation is well organized. For patent protection in the European countries it is possible to go either via the regional European Patent Office (EPO) or either via national routes.¹³ With the EPO route, only one application and examination procedure is needed, and a patent may be granted in as many of the designated states as the applicant wishes. A European patent is not a unitary patent, but a bundle of national patents with a common procedure for application, examination and grant, governed by the rules in the European Patent Convention (EPC). A national patent may thus be granted either by the EPO, or by the national patent office. After the grant of a European patent, the patent will be subject to national law in each of the states where the patent is valid.

The EU has presented proposals for a single EU patent several times, but the Member States have yet to agree on such a system.¹⁴ The EPO is separate from the EU legal system and the two institutions are not connected in any other way than the fact that the EU Member States are also members of the European

13 By the enactment of the EPC in 1973, the European Patent Organisation was created with the EPO in Munich as its executing authority. The Organisation currently has 37 Member States, including all European Union (EU) Member States as well as countries such as Norway, Switzerland and Iceland. The Member States have implemented the Convention's provisions in their national laws, which has led to a high level of harmonization of patent laws in Europe. The aim of the Organisation is the creation of a centralized procedure for the application, examination and grant of patent rights in Europe. The EPC was subject to a major revision in 2000, and the present version of the treaty is often referred to as EPC 2000 (cf. EPC 1973).

14 In December 2009 a political breakthrough was achieved in the work for an enhanced EU patent system. See "ec.europa.eu/internal_market/indprop/patent/index_en.htm" (30 May 2010) for further information.

Patent Organisation.¹⁵ The EU has therefore at present no competence in the area of software patents. It is rather the legal practice of the EPO that is indicative of the European legal position in this field.

The decisions of the EPO boards of appeal¹⁶ are an important source of law regarding the interpretation of the EPC, and consequently, the interpretation of European patent law. National patent practice and law regarding the pre-grant process is nearly unanimously harmonized and adapted to the EPC and the case law of the boards of appeal. However, the EPO have only jurisdiction in connection to the pre-grant phase, i.e. grant or refusal to grant a patent. For post-grant issues, i.e. questions of infringement or invalidity after the EPO procedure, only the national courts have jurisdiction. The case law with regard to infringement of patents is therefore not harmonized in Europe since national courts may render totally opposite decisions and there is no single uniform European patent court – yet. This is negative for the patent holders since litigation has to take place in each national jurisdiction, which is often very time-consuming and costly.

3.4 The U.S. Patent System

The U.S. patent law is constitutionally founded with the purpose ‘to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries’.¹⁷ The U.S patent system rests on a first-to-invent patent legal framework. By contrast, all other national patent laws are first-to-file systems. The patent law is found in Title 35 of the U.S. Code (U.S.C.) and gives authority for the U.S. Patent and Trademark Office (USPTO) to examine and grant patents. The U.S. Court of Appeals for the Federal Circuit (CAFC) has nationwide jurisdiction in a variety of areas, among them patents. Their decisions may be appealed to the Supreme Court.

4 Patents in the Software Industry – a Contentious Issue

There are currently various options for the form of protection available for computer programs. They range from the possibility of exclusive rights such as patents or copyright, to purely technical protection measures (that in some

15 The EU has enacted two Directives in the field of patent law with effect on national legislation: the Biotech Directive (98/44/EC) and the Enforcement Directive (2004/48/EC).

16 The EPO carries out searches and substantive examinations on a steadily rising number of European patent applications and international applications filed under the Patent Cooperation Treaty. The boards of appeal, though integrated in the organisational structure of the EPO, are independent from the EPO in their decisions and are bound only by the EPC. The technical boards of appeal and the Legal Board examine appeals from the decisions of the receiving, examining, legal and opposition divisions of the Office. To ensure uniform application of the law, or if an important point of law arises, a question can be referred to the Enlarged Board of Appeal, either by a board of appeal or by the President of the Office.

17 Art. I, section 8, the U.S. Constitution.

variants are copyright protected themselves). There is also the possibility of keeping the source code secret, which results in a time of exclusive market for the product, depending on the extent of the secrecy and the possibility of finding out the code.¹⁸ Copyright and patents are not mutually exclusive, and the two protection forms may coexist in a computer program.

Software is universally regarded as subject matter eligible for copyright protection as a literary work. The protectable subject matter consists of the source or object code, perceivable as a set of instructions. The protection of computer programs by copyright has been criticized as not being an optimal form of protection for an area which to a certain extent is technical in character.¹⁹ Copyright protects only against mere copying, while there is no protection against the making of derivative products with the use of the technical idea as such. It has been argued that against this background, the protection for software or computer programs by means of copyright may have been a conceptual mistake.²⁰ Patents may be a more suitable form of protection for such matter. Also, the computer program domain is subject to rapid development. With copyright protection, the author of the literary work (the program code) receives protection for the life of the author plus a minimum of 50 years.²¹ The protection does not result in social costs, since copyright is not dependant upon registration. Others may not use the copyright protected computer program for reproducing purposes for further developments. The source code of patented protected computer programs may be subject to further development, and despite the costs associated with the registration procedure, may further competition and technical development in a fashion superior to that of the copyright field with regard to computer program protection.²²

Patents protect the technical function of the program, which is more about the technical output than the actual code itself. As far as information technology is concerned, the main difference is that while copyright protects original computer programs as an expression of thought against unauthorized copying, patents covers the underlying ideas, procedures and methods of operation (cf. also Art. 9.2 TRIPS). The patent protection is independent from the source code, which means that a software patent is infringed already when the program is used.

The debate on software patenting has mobilized opponents and proponents in a steadily rising fashion already since the 1990s. On the one hand stands a large number of creators and also some of the right holders, strongly opposing

18 Haase, Heiko, Weyand, Joachim, *Patenting computer programs: new challenges*, IIC 2005, 36(6) 647, p. 648.

19 See Gordon, S. E., *The Very Ideal!: Why Copyright Law Is an Inappropriate Way to Protect Computer Programs*, 1998 EIPR 10, p. 12.

20 Pires de Cavalho, Nuno, *The TRIPS Regime of Patent Rights*, 2nd ed., Kluwer Law International, 2005, p. 186.

21 Art. 7(1) of the Berne Convention.

22 See Pires de Cavalho, Nuno, *The TRIPS Regime of Patent Rights*, 2nd ed., Kluwer Law International, 2005, p. 186 and *UNCTAD-ICTSD Resource Book on TRIPS and Development*, Cambridge University Press, 2005, p. 358.

exclusive patent rights over software, which they deem as detrimental for their activities. On the other hand the proponents for software patent protection speak of it in terms of an absolute necessity for the survival of the software industry. This might be true not least in Europe, where competition is fierce from mainly the U.S. and Japan.²³

From a European viewpoint, the patentability of computer programs or computer-related inventions has always been a complex issue, already when the EPC was drafted in the 1960s. Attempts to clarify the law in this field have proven unsuccessful. In 2002, the European Commission presented a proposal for a Directive on the protection by patents for computer-implemented inventions.²⁴ The Council's common position was rejected by the European Parliament in 2005, thereby closing the legislative procedure.²⁵ Nevertheless, the proposal sparked a heated debate regarding whether or not it should be possible at all to grant patents in this particular field of innovation. One of the major arguments of the opponents of patents on computer-implemented inventions was that such patents are a hindrance to research and innovation. There were also complaints about the threshold for patentability being too low, causing issuance of too many trivial patents.

The proponents of software patents are convinced that availability of patent protection is necessary for innovation and an incentive to invest in research and development (R&D). The inventions in the computer field should not be treated differently from other technical fields, and it has been stressed that computer-related inventions need to fulfill the same patentability criteria as other patents – namely novelty, inventive step and industrial application. The promoters of software patent protection also argue that copyright protection simply is not enough, as it is very easy to work around the copyright protection of the specific software.

The aim of the patent system is to give an incentive to innovate and reward the inventor for his or her contribution, and at the same time to promote the dissemination of technical knowledge for the benefit of the public at large. The effects of patent on innovation and research are held to be positive in several ways. Patents provide an incentive to invent by providing an exclusive right which may be used to hinder imitations, and the inventor should be able to recoup investments made, something which is also beneficial to society due to the positive effects of technological developments. The inventor is required to disclose detailed information of the technology of the invention. This diffusion of knowledge provides for new developments of technologies, since anyone may improve and build on inventions to create new inventions or ideas. On the other hand, the exclusive rights that patents confer may distort competition and prevent the efficient allocation of resources. They may also impede follow-on

23 See e.g. Hilty, Reto M., Geiger, Christophe, *Patenting Software? A judicial and socio economic analysis*, IIC 2005, 36(6) 615, p. 616.

24 See “europa.eu/rapid/pressReleasesAction.do?reference=IP/02/277&format=HTML&aged=1&language=EN&guiLanguage=fr” (2010-05-24).

25 See the legislative history of the Directive proposal at “ec.europa.eu/prelex /detail_dossier_real.cfm?CL=en&DosId=172020” (2010-05-24).

innovation. Therefore, the patent system needs to adjust to the right balance between ensuring appropriate returns to patent holders while encouraging technological progress for society as a whole.²⁶ Finding the right balance regarding software patents seems, for the moment, a difficult task.

In nearly every sector, not least the information technology domain, more patents per year are being awarded than ever before. It is argued that it has become easier to obtain patents in general, and that the scope of patentable subject matter has been widened to include also biotechnology and gene technology, software, and business methods. While others may argue that the patentability of such subject matter is a natural development of the patent system, there is no denying that this development will have effects on innovation. The extent of such effects is not clear, nor if they are predominantly negative or positive. One major concern is the development of so-called patent thickets, where so many patents are issued in a certain sector. This results in the concern that due to the fact that so many patents are issued now that innovation is being discouraged because it has become too difficult, too time-consuming, and too expensive for innovators to navigate around everyone else's patents.²⁷ It has been found that patents on innovative financial products and services (as compared to the drugs and health category of patents) are subject to a far higher rate of litigation than other patents, and that the parties targeted by the lawsuits are large financial firms. The plaintiffs that are most frequently involved in this type of litigation are patent holding companies with no other line of business than licensing and litigating patent awards. This development denotes a significant expenditure of resources for such lawsuits, unique for the financial sector and no doubt the effect of the earlier generous U.S. patent policy and the widespread patenting of financial institutions.²⁸

To measure the economics of patents and the effects of patent on R&D is a very difficult task, and there may be large variations between different fields of technology.²⁹ Many attempts have been made at analyzing the effects on innovation and R&D with regard to the patentability of software. The evidence in empirical studies cannot confirm either a total negative or positive impact.³⁰

26 *OECD Roundtable on Competition, Patents and Innovation*, DAF/COMP(2007)40, 8 January 2008, p. 20.

27 *Ibid.*

28 See Lerner, Josh, *The Litigation of Financial Institutions*, 2009, available at "www.people.hbs.edu/jlerner/FinPatLit.09222009.pdf" (28 June 2010).

29 Levin, Marianne, *Lärobok i immaterialrätt*, 9 uppl., Norstedts juridik AB, Stockholm 2007, p. 31.

30 See in this respect the following studies: Merges, Robert P., *Patents, Entry and Growth in the Software Industry* (August 1, 2006). Available at SSRN: <http://ssrn.com/abstract=926204> (12 May 2010) *Patents, Innovation and Economic Performance*, OECD Conference Proceedings, OECD Publishing, Paris 2004, Jaffe, Adam B., *The U.S. Patent System in Transition: Policy Innovation and the Innovation Process*, 29 *Research Policy* 531, 2000, Cohen, Wesley M., Nelson, Richard R., Walsh, John P., *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* NBER Working Paper No. 7552, 2000, and Blind, Knut, Edler, Jakob, Nack, Ralph, Straus, Joseph, *Software-Patente. Eine empirische Analyse aus ökonomischer und juristischer Perspektive*, Heidelberg: Physica, 2002.

Despite the lack of empirical evidence as to effects of increased patenting, a general tendency to work on raising the quality of the patenting process in general has been initiated by both patent offices and courts during the latest years.³¹ Many experts have also suggested that it is imperative to strengthen the inventive step/non-obvious requirement, which would reduce the number of patents being issued and also prevent patent thickets from forming.³² However, the greatest challenge yet for the patent offices and the courts has been the delimitation of what is actually patentable subject matter in the field of software and business method innovation. Both the European and U.S. case law shows prominent difficulties with the handling of this subject matter.

5 Software Patents

5.1 *TRIPS – the international legal framework*

Art. 27.1 of TRIPS regulates the area of patentable subject matter:

Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. [...] patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.³³

The patent term of protection shall be at least twenty years from the date of filing of the patent application.³⁴ According to Art. 27.1, it is an overriding requirement that patents shall be available for all types of product and process inventions, subject to the principle of nondiscrimination (with regard to the place of invention, the field of technology and whether products are imported or locally produced), and to certain facultative exceptions.

In addition, Art. 27 makes it clear that patents should be granted for *inventions*. There is no definition of the term invention – it is only assumed that an invention must exist that should fulfill certain requirements. The result is that member states are left with considerable freedom to determine the concept of invention, as well as freedom to exclude from patentability phenomena that are

31 See e.g. EPO's project on 'Raising the bar on patent quality' (2007) "www.epo.org/about-us/office/annual-reports/2007/focus.html" (30 May 2010).

32 A strong argument for a strengthened non-obvious criterion is the U.S. Supreme Court's decision in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

33 Art. 27.2 and 3 provides for exclusions from patentability on the basis of e.g. *ordre public* or morality concerns, medical methods and plant and animal varieties.

34 Art. 33, TRIPS.

considered as falling outside the invention concept.³⁵ It will be a matter for the national legal systems and practice.³⁶

According to Art. 10.1 of the TRIPS Agreement, computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention. Most national laws already protect computer programs under copyright in compliance with this requirement. As a consequence, many laws exclude computer programs *per se* from patentability.³⁷ The reason is that unless combined with hardware, computer programs are not deemed as constituting inventions since protection under Art. 10.1 is possible.³⁸ This may affect the possibilities of patenting computer programs, but the differences may not be that large, after all.

Thus, TRIPS neither requires nor prohibits the patenting of software or business methods. This is left to the member states to decide nationally. The crucial point seems to be the national view on computer programs and business methods as constituting inventions or not, i.e. whether such subject matter is actually eligible for patent protection. In this context, the concept of invention or the concept of eligible subject matter is important. The requirement in TRIPS that patents should be available in any technology only applies if the country in question considers a computer program or business method as technological phenomena.

5.2 *An International Outlook on National Legislation*

As technology moves forward the legal situation remains in flux, with most states reviewing their practices in this field. The U.S. has had a generous protection approach of computer programs and business methods, but the broad approach is currently narrowed. A similar generous protection has also been adopted by Australia and New Zealand, Israel, Japan and Singapore. The Japanese approach, where business methods are regarded as software related inventions and patentable, will probably be followed by South Korea, and possibly Singapore, Vietnam and Taiwan. The European situation is more complex, resting on the requirement for a technical effect, an approach that China seems close to at the moment. Finally, in countries like India, Pakistan Malaysia, Indonesia, the Philippines and Thailand software and business methods remain strictly non-patentable. The Canadian position is divided. Canadian patent legislation specifically excludes the patentability of business methods. While the Canadian Intellectual Property Office is quite generous in the granting of business methods patents, recent Canadian Patent Appeal Board

35 UNCTAD-ICTSD *Resource Book on TRIPS and Development*, Cambridge University Press, 2005, p. 357.

36 Pires de Cavalho, Nuno, *The TRIPS Regime of Patent Rights*, 2nd ed., Kluwer Law International, 2005, p. 171.

37 See "www.wto.int" and the WTO documents series IP/Q3 regarding the implementing legislation in national states.

38 Pires de Cavalho, Nuno, *The TRIPS Regime of Patent Rights*, 2nd ed., Kluwer Law International, 2005, p. 185.

and Federal Court decisions have on the other hand rejected business method patents.³⁹

6 Software Patents in Europe

6.1 *The Requirement of Technical Character*

Art. 52(1) of the EPC contains the essential preconditions for a European patent. There must be an invention, which is novel, inventive and has industrial applicability:

European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

Thus for an invention to be patented, the first criterion to fulfill is the notion of invention as opposed to phenomena that are not regarded as inventions and thus not patentable as such.

Art. 52(2) contains an exemplifying list of non-patentable subject matter. The common feature of the phenomena contained therein is their inability to be regarded as inventions, which makes them non-eligible subject matter:

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.

However, Art. 52(3) states that:

Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.

This as such-qualification delimits the non-eligible area so that inventions that include, but are not limited only to ineligible subject matter, would be patentable. The non-patentable area is therefore even further restricted, and non-patentable subject matter could therefore be patented as parts of inventions, as long as they are not patented as such.

In the absence of an express definition of the concept of invention in EPC, it is an established understanding in European patent law that an invention must be

³⁹ See “www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr00720.html” (12 May 2010).

of both a concrete and *technical character/technical effect*.⁴⁰ The items in the non-exhaustive list in Art. 52(2) are either abstract (e.g. discoveries, scientific theories, mathematical methods) and/or non-technical (e.g. aesthetic creations or presentations of information).⁴¹ The Guidelines for examination in the EPO establishes that in addition to the four basic requirements of patentability (invention, novelty, industrial application, novelty and inventive step)⁴², the invention needs to be of technical character:

[T]he invention must be of “technical character” to the extent that it must relate to a technical field (Rule 42(1)(a)), must be concerned with a technical problem (Rule 42(1)(c)), and must have technical features in terms of which the matter for which protection is sought can be defined in the claim (Rule 43(1))[...] ⁴³

The concept of technical character is not really elucidated by the Guidelines, despite the attempt to describe its contents. It is evident that an invention must be technical, but in what aspect and to what extent is not clear. Thus, the technical character concept is as elusive as it is important for the patentability threshold in Europe.

For some abstract phenomena, a technical character can in fact be found if the phenomenon is put to practical use. For instance, finding out a new property of a known material is a mere discovery. If that property is put into practical use, then it constitutes an invention which could be patentable.⁴⁴ A scientific theory such as e.g. the physical theory of semiconductivity would not be patentable. However, new semiconductor devices and processes for manufacturing these may be patentable.⁴⁵ Aesthetic creations as such are not patentable, but if aesthetic effects are obtained by a technical structure or other technical means such structures or means would be patentable. For example, a new layered structure for a fabric, which is technical, would be patentable.

According to the EPO, programs for computers are a form of ‘computer-implemented invention’, which is patentable provided that they cause a *further technical effect*.⁴⁶ The concept of computer-implemented invention covers claims which involve computers, computer networks or other programmable apparatus whereby ‘prima facie one or more features of the claimed invention are realized by means of a program or programs.’⁴⁷ The claims may cover a method for operating an apparatus, or the apparatus set up to execute the method. The claim may in some cases cover the program itself.⁴⁸

40 Guidelines for the examination in the EPO (April 2010) Part C, Chapter IV-1, 2.1.

41 *Ibid.*

42 Art. 52-57 EPC.

43 Guidelines for the examination in the EPO (April 2010) Part C, Chapter IV-1, 1.2(ii).

44 Guidelines for the examination in the EPO (April 2010) Part C, Chapter IV-1, 2.3.1.

45 Guidelines for the examination in the EPO (April 2010) Part C, Chapter IV-1, 2.3.2.

46 *Ibid.*

47 *Ibid.*

48 T 1173/97 (OJ EPO 10/1999, 609).

6.2 Computer-implemented Inventions – from Contribution to Further Technical Effect

Computer-implemented inventions are in fact patentable, as long as they evade the exclusion for computer programs or business methods as such in Art. 52 EPC. The main consideration is the technical character of the claimed subject matter. There is no possibility of denying patentability on the grounds of Art. 52(2) and (3) EPC as long as the claimed subject matter has technical character. The form or type of claim should not be decisive for the patentability of computer-implemented inventions, but claim formulation (product, process or use) is nevertheless important.

In general, the normal physical effects present in computer programs, i.e. electrical currents, are not in themselves sufficient to lend a computer program technical character.⁴⁹ On the other hand, if the computer program (when running on a computer) is capable of providing a further technical effect, which goes beyond these normal physical effects, it will not be excluded from patentability.⁵⁰

Art. 52(2)(c) mentions schemes, rules and methods for performing mental acts, playing games or doing business. These items are clearly of an abstract or intellectual nature. A scheme for organizing a commercial operation as well as a method of doing business would not be patentable, even ‘where it implies the possibility of making use of unspecified technical means or has practical utility.’⁵¹ Apparatuses or technical processes specified for the carrying out of such schemes are being examined as a whole, which means that technical effect may at least theoretically exist in an invention incorporating such schemes. If computers, computer networks or other conventional programmable apparatus or a program therefore are specified in the claim for the carrying out at of least part of such a scheme, rule or method, the claim is automatically regarded and examined as a computer-implemented invention.⁵²

The requirement for technical character in computer-implemented inventions was earlier subject to two competing theories: the *whole contents approach* and the *contribution approach*. The whole contents approach required only that a subject matter, when considered as a whole, use technical means to solve a technical problem or produce a technical effect. According to this theory, the claims are to be examined as a whole, not considering whether some elements were novel or non-excluded.⁵³

The contribution approach set a higher level of standard by requiring *a non-conventional result in a field of activity not excluded by Art. 52(2)*. The result of the contribution approach is the examination of a *prima facie* inventiveness of the invention.⁵⁴ This approach was usually applied to deny patentability of

49 *Ibid.*

50 Guidelines for the examination in the EPO (April 2010) Part C, Chapter IV-1, 2.3.6.

51 Guidelines for the examination in the EPO (April 2010) Part C, Chapter IV-1, 2.3.5.

52 *Ibid.*

53 Pila, Justine, *Dispute over the meaning of ‘invention’ in Art. 52 EPC – the patentability of computer-implemented inventions in Europe*, IIC 2005, 36(2) pp. 173-191, p. 176.

54 *Ibid.*

computer systems that depended for their novelty or inventive step on a non-technical or conventional source, e.g. the instructional content or conventional operation of a program, and/or produced a result in a category listed in Art. 52(2), e.g. linguistics, mental processing or computer programming.

To complicate matters further, the EPO boards of appeal has used the whole contents approach in addition to the contribution approach. The result was two lines of case law that was as contradictory as difficult to foresee, where one line suggested that programmed, general-purpose computer systems do possess the required technical character to fall outside the exclusion in Art. 52(2) EPC, and the other line came to the opposite result.

The contribution approach came to an end when the boards of appeal took position for the whole contents theory of technical character as the prevailing one and the approach required by the literal terms of the EPC. The whole contents theory requires that an invention causes a further technical effect. Thus, patents are permissible for any computer program that either comprises a necessary means of obtaining a technical effect, or manages an industrial or mechanical process.⁵⁵ This would also include any business or other method of use in a service industry.⁵⁶

6.2.1 The contribution approach

The contribution approach was developed in a number of cases, of which the most important were T 38/86 (*Text processing/IBM*), T 208/84 (*Computer-related invention/VICOM*) and T 26/86 (*X-ray apparatus/KOCH & STERZEL*).

In T 38/86 the main claim of the invention was directed to a method for automatically detecting and replacing linguistic expressions which exceed a predetermined understandability level in a list of linguistic expressions.⁵⁷ Such a method as described in the claims would, if performed by a human being, probably be regarded as a method for performing a mental act, and thus be excluded from patentability by means of Art. 52(2) EPC. However, the Technical Board of Appeal (TBA) held that in principle, using technical means to carry out a method which, if performed by a human being, would require him or her to perform mental acts, may still be regarded as a technical process or method, i.e. constitute an invention within the meaning of Art. 52(1). The reason is that Art. 52(3) EPC makes it clear that patentability is excluded only to the

55 T 935/97 (not published in the OJ EPO), T 1173/97 (OJ EPO 2001, 441), T 931/95 (OJ EPO 2001, 441).

56 See T 1002/92 (*Petterson/Queuing System*) (OJ EPO 1995, 695), where a patent was allowed for a system for determining the queue sequence of customers, as a technical apparatus in the form of a 3D object having specific functional capacities and practical application in the service of customers.

57 The understandability level of a linguistic expression refers to the difficulty which a human being may have in understanding the exact meaning of the expression in question, depending on, for example, his level of education, experience and age. One may, for example, think of an expression like 'prima facie', which for many people may be difficult to understand, being detected and replaced by, say, 'at first sight'.

extent to which the patent application relates to excluded subject matter or activities as such.⁵⁸

In this particular case, the Board started out by investigating the inventive step of the claimed subject matter. The Board held that once the steps of the method for performing the mental acts in question were defined, the implementation of the technical means to be used in those steps, i.e. a text processing system involving for instance a processor, a memory and a keyboard (indicating the use of a computer program), was not involving anything more than a straightforward application of conventional techniques. The invention was lacking inventive step.⁵⁹

The TBA also stated that the overall effect of the method was thus not technical. The claimed subject matter did not fulfill the inventive step criterion and thereby did not contribute to the art in a field not excluded from patentability by Art. 52(2) EPC. In essence, this was a true application of the contribution approach. The Board investigated the patentability criterion of inventive step first and made that criterion decisive for the claimed subject matter's patentability. The result was that the technical character or the concept of invention was not investigated at all.

The subject matter in T 208/84 (*Computer-related invention/VICOM*)⁶⁰ and T 26/86 (*X-ray apparatus/KOCH & STERZEL*)⁶¹ were, on the other hand, considered patentable since the boards of appeal decided that they made the necessary contribution to the state of the art by fulfilling the inventive step criterion. T 208/84 concerned a method of more efficient restoration or enhancement of the technical quality of an image, carried out by known hardware suitably programmed. In T 26/86 patent on an X-ray apparatus was claimed in connection with a computer program that aimed at controlling the X-ray tubes so that optimum exposure was obtained with adequate protection against overloading of the X-ray tubes. Both inventions in these cases were granted patent protection by the application of the contribution approach.

6.2.2 Further technical effect / the whole contents approach

Following a shift in the case law during the 2000s, the TBA rejected the earlier contribution approach and established a different approach, focusing on the character of the invention instead of its contribution to the art.⁶² The first signs of this change came in T 1173/97 (*Computer program product/IBM*), where the TBA came to the conclusion that the key element in the assessment of patentability of computer-related inventions would be the technical character criterion.

In T 1173/97, the Board proceeded to an interesting interpretation of the technical character of programs for computers, stating that 'it is assumed that

58 T 38/86 (OJ EPO 1990, 384) p. 391.

59 T 38/86 (OJ EPO 1990, 384) p. 392.

60 T 208/84 (OJ EPO 1987, 14).

61 T 26/86 (OJ EPO 1988, 19).

62 T 931/95 (*Controlling pension benefits system*) (OJ EPO 2001, 441).

programs for computers cannot be considered as having a technical character for the very reason that they are programs for computers'.⁶³

This means that physical modifications of the hardware (causing, for instance, electrical currents) deriving from the execution of the instructions given by programs for computers cannot *per se* constitute the technical character required for avoiding the exclusion of those programs.⁶⁴

Thus, the normal effects on the hardware caused by the software are not enough to render technical character to a computer-implemented invention. Technical character had to be found elsewhere:

It could be found in the 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 where 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.⁶⁵

Examples of such technical effect may be an industrial process or the working of a piece of machinery. The effect may also be caused by the functioning of the computer itself on which the program is being run, i.e. by the functioning of the hardware of that computer.⁶⁶ However, the physical modifications of the hardware caused by the execution of the instructions given by the program (a common feature of all computer programs) cannot *per se* constitute the technical character necessary for fulfilling the concept of invention in patent law.⁶⁷ According to the TBA, the only thing that matters when considering the patentability criteria is the further technical effect:

Determining the technical contribution an invention achieves with respect to the prior art is therefore more appropriate for the purpose of examining novelty and inventive step than for deciding on possible exclusion under Article 52(2) and (3).⁶⁸

The Board expressly pronounced that the further technical effect may already be known in the prior art.⁶⁹ The effect of such statement is that the issue of further technical effect serves the purpose of determining whether the subject matter is eligible for patentability, i.e. if it avoids the exclusion in Art. 53(2) and (3) EPC. The extent of the contribution that the invention achieves compared to prior art

63 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 6.1.

64 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 6.2.

65 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 6.4.

66 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, paras. 6.5 and 6.6.

67 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 6.6.

68 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 8.

69 *Ibid.*

is a matter for the examination of novelty and inventive step. This delimitation serves the purpose of firmly stating that the issue whether technical character resides in the subject matter is a separate task from the actual examination of the patentability criteria of novelty and inventive step.

When examining the claims, the patent office or appeals board need to find the further technical effect in the subject matter as defined in the claims. The further technical effect which is necessary for technical character to reside in a computer program is not always disclosed directly in physical reality by the (computer program) product, but only shows when the program is being run on a computer. The fact that the product as such does not produce a direct technical effect but rather a ‘potential to produce a further technical effect’ (indirect technical effect) does not exclude the subject matter from patentability under Art. 52(2) and (3).⁷⁰ It is not a hindrance for patentability that the basic idea underlying the invention resides in the computer program itself.⁷¹ However, in no case has the TBA attributed a technical character to a computer program for the sole reason that the program is destined to be used in a technical apparatus, i.e. a computer.⁷²

If the computer program comprises a patentable method (e.g. for the operation of a computer), the said method is in principle not excluded by Art. 52(2) and (3), but the claims need to incorporate all the features which assure the patentability of the methods when being run on a computer.⁷³

The findings in T 1173/97 were consistent with the reasoning in T 935/97 (*Computer program product II/IBM*).⁷⁴ In conclusion, these cases established that a computer program product, which may very well consist of the program itself, that has technical character (that should be established in accordance with the TBA’s reasoning as laid out in these cases) was not to be considered as a program as such and, consequently, represented a patentable invention (which should be subject to further examination in regard to the patentability criteria of novelty and inventive step).

6.3 *Business Methods Patents*

The case law regarding patentability of business methods follows the general development for computer-implemented inventions with the requirement of a further technical effect for a technical character to exist. Starting with T 931/95 (*Controlling pension benefits system/PBS PARTNERSHIP*)⁷⁵ the TBA had to investigate the question of patentable subject-matter in relation to the exclusion for methods for doing business in Art. 52(2).

The main request of claim 1 related to a ‘method of controlling a pension benefits program by administering at least one subscriber employer account’,

70 T 1173/97, Reasons for the Decision, para. 9.4.

71 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 7.4.

72 T 1173/97 (OJ EPO 1999, 609) Reasons for the Decision, para. 7.1.

73 T 1173/97, Reasons for the Decision, para. 9.6.

74 T 935/97 (not published in the OJ EPO).

75 T 931/95 (OJ EPO 2001, 441).

including various computing means. The features of this claim were steps of 'processing and producing information having purely administrative, actuarial and /or financial character', typical steps of business and economic methods.⁷⁶ Also claimed was an apparatus for controlling the pension benefits system method.⁷⁷

Following the reasoning set out in accordance with the whole contents approach, the TBA had to decide if the method in question had a technical character. If a method has a technical character it falls outside the exclusion in Art. 52(2) by virtue of Art. 52(3), since it is not considered to be a method for doing business 'as such'. The technical character criterion will thus prevent the subject-matter in question from being defined as one of the as such-excluded categories in Art. 52(2), since those are purely abstract or non-technical in character.

In the view of the TBA, the claimed method involved only economic concepts and practices of doing business and thereby constituted a typical as such-business method, thereby lacking in technical character and belonging to the abstract category listed in Art. 52. The use of technical means, e.g. data processing and computing means, did not alter the purpose of the claimed method, which the Board held to be purely non-technical, in addition to the purely non-technical information that was processed:

[T]he individual steps defining the claimed method amount to no more than the general teaching to use data processing means for processing or providing information of purely administrative, actuarial and/or financial character, the purpose of each single step and of the method as a whole being a purely economic one.⁷⁸

The Board continued:

The feature of using technical means for a purely non-technical purpose and/or for processing purely non-technical information does not necessarily confer technical character to any such individual steps of use or to the method as a whole: in fact, any activity in the non-technical branches of human culture involves physical entities and uses, to a greater or lesser extent, technical means.⁷⁹

The method was therefore considered as a business method as such and considered unpatentable subject matter. On the other hand, the claim directed to the apparatus for the performance of the method was considered patentable:

[I]f a claim is directed to such [a physical entity or product], the formal category of such a claim does in fact imply physical features of the claimed subject-matter

76 T 931/95, Reasons for the Decision, para. 3.

77 Claim 5 of the main request. See T 931/95, Summary of facts and Submissions, para. II.

78 T 931/95, Reasons for the Decision, para. 3.

79 *Ibid.*

which may qualify as technical features of the invention concerned and thus be relevant for its patentability.⁸⁰

One of the conclusions of T 931/95 is that an apparatus constituting a physical entity or concrete product suitable for performing or supporting an economic activity is an invention within the meaning of Art. 52(1) EPC.⁸¹ The Board also noted that the earlier contribution approach had already been considered non-applicable in earlier decisions, something that would apply equally to business methods, thereby creating precedent for the business method domain as well.⁸²

In T 258/03 (*Auction method/HITACHI*), the invention consisted of an ‘automatic auction method executed in a server computer’, basically a method for conducting on-line auctions.⁸³ Also claimed were a ‘computerised auction apparatus’ comprising a server computer, and a computer program for carrying out an auction. The features of the claims were closely related and based on the same method steps.

The TBA stated that the term invention in Art. 52 EPC is to be construed as ‘subject-matter having technical character’. The Board also resolutely stated that the verification that claimed subject-matter is an invention within the meaning of Art. 52(1) EPC is a prerequisite for the examination with respect to novelty, inventive step and industrial application.⁸⁴ The three latter requirements are defined only for inventions.⁸⁵ Thus, in order to examine the criteria of novelty, inventive step and industrial application, the question of whether or not the subject-matter under scrutiny qualifies as an invention should be answered first.

This statement from the TBA clearly places the determination of invention and technical character before the examination of novelty, inventive step and industrial application, thereby rejecting the earlier contribution approach where the assessment of technical character was somewhat mixed with the examination of inventive step. An effect of this reasoning is also that when deciding upon technical character/invention in accordance with Art. 52 it is possible to do so

80 T 931/95, Reasons for the Decision, para. 5.

81 *Ibid.*

82 T 931/95, Reasons for the Decision, para. 6 with reference to T 1173/97 (OJ EPO 2001, 441) and T 935/97 (not published in the OJ).

83 T 258/03 (OJ EPO 2004, 575). The method was defined in Claim 1 of patent application EP97306722.6. The auction method claimed was described as follows: ‘The auction starts with preliminary steps of data exchange between the client computers and the server computer in order to collect bids from the participants. Each bid comprises two process, a “desired price” and a “maximum price in competitive state”. After this initial phase the auction is automatic and does not require that the bidders follow the auction on-line. An auction price is set and successively lowered (which is typical for so-called Dutch auctions) until it reaches the level of the highest bid or bids as determined by the “desired price”. In case of several identical bids the price is increased until only the bidder having offered the highest “maximum price” is left. He is declared successful. Claim 1 does not specify the exact price paid, nor the rules and conditions for determining the amounts of the product to be allotted.’ T 258/03, Reasons for the Decision, para. 2.

84 T 258/03, Reasons for the Decision, para. 3.1.

85 *Ibid.*

without any knowledge of the state of the art.⁸⁶ The comparison with prior art is therefore a non-issue in the evaluation of invention/technical character, but rather comes into the determination of novelty and inventive step.⁸⁷

Another consequence expressly pronounced from *HITACHI* is that the as such-qualification in Art. 52(3) makes a mix of technical and non-technical features patentable.⁸⁸ On the basis of this reasoning, the Board in *HITACHI* concluded that the claimed apparatus as well as the auction method was patentable. This finding was to a certain extent surprising against the background of the reasoning in *Pension benefits system*, where it was stated that ‘a feature of a method which concerns the use of technical means for a purely non-technical purpose and/or for processing purely non-technical information does not necessarily confer a technical character to such a method’.⁸⁹ The Board held that the reason for taking this new approach was that an assessment of the technical character of a method based on the degree of banality of the technical features of the claim would involve remnants of the contribution approach.⁹⁰ Instead, the Board applied a rather extensive interpretation of the term invention in Art. 52(1), including a broad spectra of activities that would be susceptible of technical character, even though they seem familiar, such as e.g. the act of writing using pen and paper. The Board stressed that not all these methods would be patentable, since they must remain novel, inventive and industrially applicable.⁹¹ Although the auction method was considered as having technical character, the application was rejected due to lack of inventive step.

In T 424/03 (*Clipboard formats I/MICROSOFT*) the main claim related to a method implemented in a computer system.⁹² The claimed method modified the internal operation of a computer system, and was specified as using several clipboard formats including a text clipboard format, a file contents clipboard format and a file group descriptor format. The clipboard functioned as a memory. According to the Board, a computer system including a memory (clipboard) was a technical means, and consequently the claimed method has technical character in accordance with established case law (referring to *HITACHI*).⁹³

Addressing the issue of method claim versus product claim (computer program), the Board emphasized that a method implemented in a computer system represents a sequence of steps actually performed and achieving an effect, and not a sequence of computer-executable instructions (i.e. a computer program) which just have the potential of achieving such an effect when loaded

86 T 258/03, Reasons for the Decision, paras. 3.1-3.2.

87 T 258/03, Reasons for the Decision, paras. 3.1-3.4.

88 T 258/03, Reasons for the Decision, para. 3.5.

89 T 931/95, Reasons for the Decision, para. 3. Cf also Guidelines C-IV, 2.3.6, penultimate paragraph, second sentence.

90 T 258/03, Reasons for the Decision, para. 4.3.

91 T 258/03, Reasons for the Decision, para. 4.6.

92 T 424/03 (not published in the OJ EPO).

93 T 424/03, Reasons for the Decision, 5.1.

into and run on a computer.⁹⁴ The effect of this distinction is that the claim category of a computer-implemented method would be distinguished from that of a computer program. Methods, particularly a method that operates a computer, may be put into practice with the help of a computer program, but that does not equal that a method claim actually claims the computer program as such, but rather the other way around.

In relation to the technical character of the claimed method in question, the Board stated that:

These steps solve a technical problem by technical means in that functional data structures (clipboard formats) are used independently of any cognitive content [...] in order to enhance the internal operation of a computer system with a view to facilitating the exchange of data among various application programs. The claimed steps thus provide a general purpose computer with a further functionality: the computer assists the user in transferring non-file data into files.⁹⁵

The Board also found that the computer program claimed was not a computer program as such, and thereby possessed technical character.⁹⁶ The invention was considered novel and inventive, and was thus granted patent protection.

6.4 G 3/08 – the EBA Fails to Clarify the EPO Position on Software Patentability

Following the controversies on software patents that started during the 1990s and remained into the new millennium, the EPO case law on computer-implemented inventions came under scrutiny for several years. The main point of criticism was claims of diverging interpretations regarding the computer program exclusion by the EPO boards of appeal which allegedly resulted in legal uncertainty. National courts and the public also expressed concerns that the boards were interpreting the exclusion in Art. 52(2) and (3) too restrictive.⁹⁷

In 2008, the EPO President Alison Brimelow referred four questions regarding the application of the exclusion of computer programs as such to the Enlarged Board of Appeal (EBA) for clarification of matters.⁹⁸ The EBA

94 *Ibid.*

95 T 424/03, Reasons for the Decision, 5.2.

96 T 424/03, Reasons for the Decision, 5.3.

97 Referral under Art. 112(1)(b) EPO by EPO President Alison Brimelow, 23 October 2008, p. 2.

98 The questions read as follows:

1. Can a computer program only be excluded as a computer program as such if it is explicitly claimed as a computer program?
- 2.(a) Can a claim in the area of computer programs avoid exclusion under Article 52(2)(c) and (3) merely by explicitly mentioning the use of a computer or a computer-readable storage medium?

opinion was issued in May 2010, and to the disappointment of many the EBA refrained from clarifying the legal situation by holding the referral inadmissible on the ground that there were no diverging interpretations, and the differences between the board's decisions resulted from natural developments of case law.

Nevertheless, the EBA made some clarifying statements regarding claim formulation and patentability. In the referral, the EPO president refers to what appears to be diverging decisions in regard to claim formulation and substance of the invention.

The EBA investigated the formulations of the different cases, and held that the TBA in T 1173/97 had come to the conclusion that only some computer programs, claimed alone, were excluded from patentability. In this regard, the TBA had stated that 'with regard to the exclusions under Art. 52(2) and (3) EPC, it does not make any difference whether a computer program is claimed by itself or as a record on a carrier'.⁹⁹ Thus, even programs not claimed as programs but as e.g. a record on a carrier would also be excluded if the subject-matter of such a claim would be found to be a computer program as such, lacking in technical character. The TBA in T 1173/97 considered that a claim to a computer program product could not escape the exclusions of Art. 52(2) merely by comprising a computer-readable medium, nor would claiming a computer loaded with a program or the execution of a program on a computer be sufficient to escape the exclusion.¹⁰⁰

It seems as if the EBA disputed the allegation that claim formulation would have an impact on the determination of the exclusion for computer programs as such. Following the EBA, the main question to be asked in regard to the Art. 52(2) and (3) exclusions is whether the claimed subject-matter has technical character. When a computer program is claimed, it has technical character 'if and only if the program causes a 'further technical effect' when run.'¹⁰¹ As

(b) If question 2(a) is answered in the negative, is a further technical effect necessary to avoid exclusion, said effect going beyond those effects inherent in the use of a computer or data storage medium to respectively execute or store a computer program?

3. (a) Must a claimed feature cause a technical effect on a physical entity in the real world in order to contribute to the technical character of the claim?

(b) If Question 3(a) is answered in the negative, can features contribute to the technical character of the claim if the only effects to which they contribute are independent of any particular hardware that may be used?

4. (a) Does the activity of programming a computer necessarily involve technical considerations?

(b) If Question 4(a) is answered in the positive, do all features resulting from programming thus contribute to the technical character of a claim?

(c) If Question 4(a) is answered in the negative, can features resulting from programming contribute to the technical character of a claim only when they contribute to a further technical effect when the program is executed?

⁹⁹ T 1173/97, Reasons for the Decision, para. 13.

¹⁰⁰ G 3/08 (Programs for computers) of 12 May 2010, paras. 10.2.2-10.2.4.

¹⁰¹ G 3/08, Reasons for the Decision, para. 10.4.

stated in earlier case law, the further technical effect need not be new, thus the EBA agreed in clearly abandoning the earlier contribution approach.¹⁰²

Even though it would be possible to avoid the exclusions in Art. 52(2) and (3) by mere claim formulation (i.e. to claim a computer-implemented method or a computer program on a computer-readable storage medium), this does not mean that the list of subject-matters in Art. 52(2) EPC has no bearing on such claims. However, the main issue for determining patentability of such subject-matter will probably be the inventive step evaluation. The main question for the future will be how those elements of a claim that relate to excluded subject-matter be treated when assessing novelty and inventive step.

On the issue of technical character and further technical effect, the EBA considered that all computer programs have technical effects, 'since e.g. when different programs are executed they cause different electrical currents to circulate in the computer they run on'.¹⁰³ These technical effects alone are, however, not sufficient to confer technical character upon the programs – they must cause further technical effects. In terms of programming a computer, it is not enough to demonstrate that the program which results from the programming has technical character; the programmer must have had technical considerations beyond merely finding a computer algorithm to carry out some procedure.¹⁰⁴

6.5 *Conclusions*

The state of European patent law with regard to software inventions is still quite complicated. From a general perspective, the interpretation of Art. 52 seems quite narrow and the possibilities of patenting computer programs and business methods seem good. The TBA, supported by the EBA opinion in G 3/08 has advocated the whole contents approach with the further technical effect as a decisive criterion for patentability. However, the assessment of patentability is still unpredictable on a case-by-case basis, where the application of the general criteria is conducted on a specific application. The perceived differences between the decisions is still a source for further concerns. Furthermore, this has been fueled by the negative effects that the lack of authoritative guidance by the EBA opinion in G 3/08 may have on predictability in the software patent field. The European situation could have benefited from some clarifications at this stage.

102 *Ibid.*

103 G 3/08, Reasons for the Decision, para. 13.5.

104 *Ibid.*

7 Software Patents in the U.S.

7.1 Statutory Patent Eligibility

Section 35 § 101 of the U.S.C. sets out the basic requirements for patentability:

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 therefor, subject to the conditions and requirements of this title.

The area of patentable subject matter is very broad. It was recognized quite early that the statutory subject matter was intended to cover ‘anything under the sun that is made by man’.¹⁰⁵ This expression has been used throughout case law, supported by the Supreme Court.¹⁰⁶ The U.S. Patent law has no legal subject matter exceptions to patentability as in the EPC, nor any equivalent to the European requirement of technical character. However, the Supreme Court has recognized a judicial exception for phenomena of nature, mental processes and abstract intellectual concepts, which excludes phenomena such as a naturally occurring substance or a fundamental mathematical formula.¹⁰⁷

An alleged invention must fall into one of the defined categories of process, machine, manufacture or composition of matter. A *process* is defined as ‘an act, or a series of acts or steps that are tied to a particular machine or apparatus or transform a particular article into a different state or thing.’ A *machine* is ‘a concrete thing, consisting of parts, or of certain devices and combination of devices. This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result.’ The definition of *manufacture* is ‘an article produced from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by handlabor or by machinery.’ Finally, the term *composition of matter* covers ‘all compositions of two or more substances and all composite articles, whether they be the results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids, for example.’¹⁰⁸

A claim which is directed towards subject matter outside any of the four categories is considered unpatentable, because it covers non-statutory subject matter. Also, if the claim wholly embraces a judicially recognized exception¹⁰⁹, or constitutes a particular practical application of a judicial exception, the claim

105 S. Rep. No. 1979, 82nd Cong., 2d Sess. (1952) p. 5, H.R. Rep. No. 1923, 82d Cong., 2nd Sess. (1952) p. 6.

106 See *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

107 Halpern, Sheldon W., Nard, Craig Allen, Port, Kenneth L., *Fundamentals of United States Intellectual Property Law: Copyright, Patent, Trademark*, 2nd ed., Kluwer Law 2007, p. 202.

108 USPTO Interim Examination Instructions For Evaluating Subject Matter Eligibility Under 35 U.S.C. 101, August 2009, pp. 1-2.

109 Which includes abstract ideas, mental processes or substantially all practical uses (pre-emption) of a law of nature or a natural phenomenon.

would be rejected too.¹¹⁰ The reason for excluding laws of nature and natural phenomena is because such manifestations occur within nature, and thus, are not subject to invention by man and therefore are not patentable inventions.¹¹¹

7.2 Judicial Developments

A claim to a computer program *per se* or to a computer readable medium that can be e.g. a compact disc or a carrier wave covers a non-statutory embodiment, and would be rejected as non-statutory subject matter. Nevertheless, in 1981 the Supreme Court held in *Diamond v. Diehr*¹¹² that claims incorporating mathematic formulae were not automatically unpatentable, and this marked the beginning of an era of patenting of computer programs.¹¹³ The Supreme Court stated that a claim is patentable if it contains ‘a mathematical formula [and] implements or applies the formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect’.¹¹⁴ Thus, statutory subject matter does not become non-statutory simply because it uses a mathematical formula, computer program, or digital computer. It is of interest to note that the American policy towards computer program patents is the result of jurisprudence implemented mainly by the USPTO and not of a legislative decision.¹¹⁵

The Supreme Court declared already in the 1970s that a process was patentable if it utilized a physical apparatus or brought about a physical transformation in the process’s subject matter. This approach did not expressly state that these indicia represented the full scope of patentable processes – however, these were the clues to patentability.¹¹⁶

The case of *Gottschalk v. Benson*¹¹⁷ concerned a patent application claiming a mathematical algorithm embodied in a program embedded in a piece of hardware to convert binary-coded decimal numerals to pure binary numerals. The Court rejected the application on the grounds that ‘[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.’¹¹⁸ Thus, no exclusive rights were to be granted over such basic tools as

110 USPTO Interim Examination Instructions For Evaluating Subject Matter Eligibility Under 35 U.S.C. 101, August 2009, pp. 2-3.

111 Schuster, W. M., *Predictability and Patentable Processes: The Federal Circuit’s In re Bilski Decision and its Effect on the Incentive to Invent*, The Columbia Science and Technology Law Review, Vol XI 2010, 1, p. 5.

112 *Diamond v. Diehr*, 450 U.S. 175 (1981).

113 *Ibid.*

114 *Diamond v. Diehr*, 450 U.S. 175 (1981).

115 See Hilty, Reto M., Geiger, Christophe, *Patenting Software? A judicial and socio economic analysis*, IIC 2005, 36(6) 615, p. 620.

116 Schuster, W. M., *Predictability and Patentable Processes: The Federal Circuit’s In re Bilski Decision and its Effect on the Incentive to Invent*, The Columbia Science and Technology Law Review, Vol XI 2010, 1, p.2.

117 409 U.S. 63 (1972).

118 409 U.S. 63 (1972) pp. 66-67.

that would also preclude any further use of the algorithm. The possible limitations that tied the process to a computer were not actually limiting because the fundamental principle at issue, a particular algorithm, had no utility other than operating on a digital computer.¹¹⁹

In *Diamond v. Diehr*¹²⁰ the Court found that an improved process for curing raw rubber into a usable product (vulcanization of rubber) comprising the use of the Arrhenius equation was patentable subject matter. The fundamental principle was found to be embedded in an otherwise patentable process, and was therefore included in the statutory category of processes.¹²¹ The use of the equation was a constituent element of the invention, and the claimed invention was also very limited in scope (curing rubber), so that future uses of the equation for other purposes were not precluded by the patent. The distinction was also made that a particular application of a fundamental principle would be patentable, as opposed to claims seeking to pre-empt the use of such a principle, which would be non-patentable.

In 1998, the case of *State Street bank* which concerned a business method was decided by the Court of Appeals of the Federal Circuit (CAFC). The Court promulgated the positive rule that a process was patentable if it brought about a ‘useful, concrete and tangible result’.¹²² The patent in question was directed to a data processing system for implementing an investment structure. The structure was used as an administrator and accounting agent for mutual funds. In essence, the patented invention was a system that allowed an administrator to monitor and record the financial information flow and make all calculations necessary for maintaining a partner fund financial services configuration. Such a configuration allowed several mutual funds to pool their investment funds into a single portfolio, allowing for consolidation of, inter alia, the costs of administering the fund combined with the tax advantages of a partnership. The CAFC had declared that:

The question of whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to – process, machine, manufacture, or composition of matter – but rather on the essential characteristics of the subject matter, in particular, its practical utility. Section 101 specifies that statutory subject matter must also satisfy the “other conditions and requirements” of Title 35, including novelty, nonobviousness, and adequacy of disclosure and notice. [...] For purpose of our analysis [...], claim 1 is directed to a machine programmed with the [...] software and admittedly produces a “useful, concrete and tangible result.”¹²³

119 See the reasoning in *In re Bilski*, 545 F.3d 943 (2008) p. 13.

120 450 U.S. 175 (1981).

121 450 U.S. 175 (1981) p. 177.

122 *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1370 (Fed. Cir. 1998). See also *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999).

123 *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1370 (Fed. Cir. 1998) p. 1375.

Thus, the analysis of the invention in *State Street Bank* resulted in patentable subject matter with reference to the fact that the process in question produced a useful, concrete and tangible result, despite the fact that the process consisted of a mathematical algorithm and the result was expressed in numbers (price, profit, percentage, cost or loss). The decision paved way for a flood of business method patents. In essence, the possibilities of patenting software and business methods were many in the U.S., as long as the subject matter did not wholly encompass or pre-empt a fundamental principle. This development was recently restricted by both the CAFC and the Supreme Court.

7.3 *Time for Change? The Bilski Patent Application*

7.3.1 **The Claimed Invention**

Bilski's claimed business method basically consisted of a method for buyers and sellers of commodities in the energy market could protect, or hedge, against the risk of price changes.¹²⁴ The patent application consisted of 11 claims. Of interest was claim 1, the main claim. In essence, that claim covered the process for creating contractual relationships intended to hedge risks in a financial transaction. The CAFC explained the claim as follows:

For example, coal power plants (i.e., the "consumers") purchase coal to produce electricity and are averse to the risk of a spike in demand for coal since such a spike would increase the price and their costs. Conversely, coal mining companies (i.e., the "market participants") are averse to the risk of a sudden drop in demand for coal since such a drop would reduce their sales and depress prices. The claimed method envisions an intermediary, the "commodity provider," that sells coal to the power plants at a fixed price, thus isolating the power plants from the possibility of a spike in demand increasing the price of coal above the fixed price. The same provider buys coal from mining companies at a second fixed price, thereby isolating the mining companies from the possibility that a drop in demand would lower prices below that fixed price. And the provider has thus hedged its risk; if demand and prices skyrocket, it has sold coal at a disadvantageous price but has bought coal at an advantageous price, and vice versa if demand and prices fall.¹²⁵

The application disclosed that the recited transactions may simply involve options, i.e., rights to purchase or sell the commodity at a particular price within a particular timeframe.¹²⁶ It is important to note that the claim was not limited to transactions involving actual commodities, not to the energy sector. The claimed business method was actually very broad.

¹²⁴ *Bilski et al. v. Kappos*, U.S. Supreme Court, 561 U. S. ____ (2010) No. 08–964. Argued November 9, 2009—Decided June 28, 2010, p. 2.

¹²⁵ *In re Bilski*, 545 F.3d 943 (2008) 88 U.S.P.Q. 2d 1385 (Fed. Cir. 2008) p. 2-3.

¹²⁶ *In re Bilski*, p. 3.

7.3.2 *In re Bilski* – the CAFC narrows the patentability of business methods

In re Bilski marked a shift in the CAFC's position on business methods patentability towards a more restrictive approach.¹²⁷ With a strong emphasis placed on the so-called *machine-or-transformation* test in determining the patentability of process claims, the CAFC rejected earlier precedents of § 101-tests, among them the often cited useful, concrete and tangible result-test first mentioned in *Diehr* and later developed in the *State Street Bank*-decision.¹²⁸ The CAFC held that the inquiry of whether a process has produced a useful, concrete and tangible result is insufficient to determine whether a claim is patent-eligible under § 101, and envisaged the machine-or-transformation test as the sole criterion for determining patent eligibility of business methods.

The machine-or-transformation test was first articulated in *Benson* and was also followed in later practice.¹²⁹ It consists of two (alternative) criteria. According to the test, a claimed process is patent-eligible under § 101 U.S.C. if:

(1) it is tied to a particular machine or apparatus,

or

(2) it transforms a particular article into a different state or thing.¹³⁰

Since the *Bilski*'s main claim was not tied to any machine or apparatus, the remaining option for patentability was for claim 1 to satisfy the transformation branch of the machine-or-transformation test. The CAFC found that claim 1 was not patentable because it did not consist of patent-eligible subject matter. According to the Court, the process as claimed did not transform any article to a different state or thing. The main problem was that the alleged invention did not consist of any physical objects or substances. The Court held that:

Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances. [...] [T]he process as claimed encompasses the exchange of only options, which are simply legal rights to purchase some commodity at a given price in a given time period. The claim only refers to "transactions" involving the exchange of these legal rights at a "fixed rate corresponding to a risk position."¹³¹

¹²⁷ *In re Bilski*, 545 F.3d 943 (2008) 88 U.S.P.Q. 2d 1385 (Fed. Cir. 2008).

¹²⁸ *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1370 (Fed. Cir. 1998).

¹²⁹ E.g. *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 113 (1853), *Cochrane v. Deener*, 94 U.S. 780, 788 (1876), *Tilghman v. Proctor*, 102 U.S. 707, 729 (1880), *Parker v. Flook*, 437 U.S. 584 (1978), *Diamond v. Diehr*, 450 U.S. 175 (1981).

¹³⁰ See *Gottschalk v. Benson*, 409 U.S. 63 (1972) p. 70.

¹³¹ *In re Bilski*, p. 28.

The process claim was seen as wholly directed against the mental and mathematical process of identifying transactions that would hedge risk, and thus was not eligible for patent protection. The patent was consequently denied.

Mayer J. dissented on the ground that the majority opinion failed to completely overrule *State Street Bank*. He expressed the opinion that affording patent protection for business methods lacks constitutional and statutory support, and would *inter alia* hinder innovation and rightfully belongs in the public domain. Rader J. dissented on the ground that the decision as expressed by the majority propagated unanswerable questions instead of simply denying patentability without launching into a reasoning which only caused further ambiguities. The third dissenting judge, Newman J., was the only one which would have allowed the patent.¹³²

7.3.3 *Bilski v. Kappos* – the Supreme Court sets the standard?

The Supreme Court strongly rejected the use of the machine-or-transformation test as the exclusive test for deciding on patentability of processes. According to the Court such a decision would violate statutory interpretation principles.¹³³ The Court cautioned that courts’ ‘should not read into the patent laws limitations and conditions which the legislature has not expressed’.¹³⁴ Also, in patent law just as in all statutory construction, ‘words will be interpreted as taking their ordinary, contemporary, common meaning’, unless otherwise defined.¹³⁵ In this context, there was nothing in the Patents Act that would tie a process to either a machine or a transformation, and such a limitation had not support in the statutory text, held the court.

The majority opinion affirmed the categories of patentable statutory subject matter as well as the specific exceptions established by precedent; laws of nature, physical phenomena and abstract ideas. The Court held that the §101 patent-eligibility inquiry is only a threshold test, as the invention needs to fulfill the patentability criteria and other additional requirements.¹³⁶ The Court did not, however, completely rule out the use of the machine-or-transformation test, and held that the test is a ‘useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under §101’, but it is not the sole test.¹³⁷ The Supreme Court also affirmed that generally, business methods are not excluded from patent protection as processes under §101, although some business method patents undoubtedly cause problems due to their

132 See the dissenting opinions of *In re Bilski*.

133 *Bilski et al. v. Kappos*, U.S. Supreme Court, 561 U.S. (2010) No.08-964. Argued November 9, 2009. - Decided June 28, 2010 p. 7.

134 *Bilski et al. v. Kappos*, p. 5, with further references to *Diamond v. Diehr*, 450 U. S. 175, 182 (1981) and *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

135 *Bilski et al. v. Kappos*, p. 6, with further references to *Diamond v. Diehr*, 450. U. S. 175, 182 (1981) and *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931).

136 *Bilski et al. v. Kappos*, p. 5.

137 *Bilski et al. v. Kappos*, p. 8.

vague nature and suspect validity.¹³⁸ The Court stated that a high enough bar must be set for patent applications of business methods, and that the unpatentability of abstract ideas could act as a tool against such applications.¹³⁹

Thus, the Court declined the sole use of the machine-or-transformation test for the patentability of processes, and declined excluding business methods as such from patentability. Despite these rejections, the Court seemed to be concerned with the problems that information technology patents may cause, and advocated for the use of limiting principles established within the system. Such limiting principles are the unpatentability of abstract ideas and a proper use of the patentability criteria of novelty, nonobviousness and full and particular description.

The Supreme Court recited the principles for the prohibition against the patenting of abstract ideas established in *Benson*¹⁴⁰, *Flook*¹⁴¹ and *Diehr*¹⁴², and held that despite the general unpatentability of such phenomena, the prohibition is not a hindrance to patent algorithms that are limited and can still be freely used outside the domain of the invention. The application of a law of nature or mathematical formula to a known structure or process may also be patentable.¹⁴³ Also, it is necessary to consider the invention of a whole, and not examine the claims in parts.¹⁴⁴ On the basis of these precedents, the Court simply concluded that the process in *Bilski*'s application was not patentable, since it concerned an abstract idea.¹⁴⁵ The idea consisted of the concept of hedging, or protecting against risk. Nor was the idea limited to a certain field of use, but broad examples of the use of hedging in commodities and energy markets. Consequently, the patent application was rejected by the Supreme Court.¹⁴⁶

The reluctance to support the view of the CAFC on the exclusivity of the machine-or-transformation test stems from the need to adapt patent law to new technological progress, and that an exclusive and refined test would cause difficulties in securing patent rights for new innovations. New technologies may demand new inquiries.¹⁴⁷ Although the Court expressed concerns over the problems connected with software and business method patents, especially the overflow of trivial patent applications and the effects on business and innovation, it also emphasized that the decision did not address the general issue of patent protection in information technologies and the difficulties in finding

138 *Bilski et al. v. Kappos*, p. 11, with further reference to *eBay Inc. v. MercExchange, L. L. C.*, 547 U. S. 388, 397 (2006).

139 *Bilski et al. v. Kappos*, p. 12.

140 *Gottschalk v. Benson*, 409 U.S. 63 (1972).

141 *Parker v. Flook*, 437 U.S. 584 (1978).

142 *Diamond v. Diehr*, 450 U. S. 175, 182 (1981).

143 *Bilski et al. v. Kappos*, p. 14.

144 Cf. The whole contents approach applied by the EPO.

145 *Bilski et al. v. Kappos*, p. 15.

146 *Bilski et al. v. Kappos*, p. 16.

147 *Bilski et al. v. Kappos*, p. 9.

the proper balance between protecting inventors and not granting monopolies over subject matter that should be free for all to use.¹⁴⁸ The result of the Supreme Court *Bilski* decision is a failure to provide practical guidance for courts and authorities regarding the actual limitations for business method patents. The Court argues for a restriction of such patents but provides no specific tools.

The Supreme Court reached its decision by a unanimous rejection of the patent application, but the grounds for refusal were only reached through a 5 to 4 vote, where the minority issued a dissenting opinion. In Stevens J.'s lengthy and detailed dissenting opinion, with whom Ginsburg J., Breyer J. and Sotomayor J. concurred, he argued from a historical and constitutional basis for a complete ban on business methods patents in general, as they from that point of view are not covered by the statute and consequently are not processes within the meaning of §101.¹⁴⁹

7.4 *The effects of Bilski for the future of business method patents in the U.S.*

The rejection of *Bilski*'s patent application by the Supreme Court was based on a reluctance to impose limitations to patentability that was not consistent with the text of the Patents Act. The Court held that it was sufficient for the rejection to follow the precedents on the unpatentability of abstract ideas, and no further definition of a patentable process was necessary beyond the established definition in §100(b) and the guidelines laid out in *Benson*, *Flook* and *Diehr*. The Court also strongly rejected CAFC's earlier interpretations of §101¹⁵⁰ and disapproved the exclusive use of the machine-or-transformation test. The Court left open the question of exactly what is needed for a business method to be considered patentable subject matter. Although the narrow interpretation imposed by the CAFC was rejected, the area of business method patents will probably go through a future of further limiting criteria developed by the CAFC, based on the concerns articulated by the courts of the effects of computer programs and business method patents on 'creative endeavor and dynamic change'.¹⁵¹

Although the Supreme Court clarified the role of the machine-or-transformation test, issues are left unresolved and others were left unaddressed. This is evident from the dissenting opinions in both the Supreme Court and the CAFC. It is interesting to note that both decisions were not unanimous. The Supreme Court decision was reached five to four, and the CAFC was seated en

148 *Bilski et al. v. Kappos*, p. 10.

149 *Bilski et al. v. Kappos*, p. 47 of the dissenting opinion by Stevens J. Breyer J. wrote an additional dissenting opinion rejecting business methods patents, but also concurred with Stevens J. on all points.

150 E.g. *State Street*, 149 F. 3d, *AT&T Corp.*, 172 F. 3d.

151 *Bilski et al. v. Kappos*, p. 12.

banc¹⁵², but the decision was only reached through a majority opinion (nine to three).

The major criticism against the CAFC's decision in *In re Bilski* is its lack of useful guidance for those 'on the ground', as pointed out by Mayer and Rader JJ. The Court only addresses a minimum of the issues to give a basis for the judgment and avoids the rest of the questions.¹⁵³ This is true for the Supreme Court's decision as well. The opinion sets out the grounds for limiting the area of patentable subject matter but it gives no real guidance in the practical application of the principles contained therein. The rejection of the machine-or-transformation test as the sole test for determining patent eligible subject matter does not clarify to what extent this test should be used, neither what other types of tests that are applicable. The Supreme Court signals a restrictive view of business method patents, but the exact practical limitations is left for the CAFC and lower authorities to set out under the framework created by *Bilski v. Kappos*. Against this background it is expected that the machine-or-transformation test will still be used to a large extent. The restrictive path signaled by the Supreme Court and the CAFC, and the strong rejections of the generous *State Street*-test for determining patentability indicates a shift towards a more restraining approach, and the machine-or-transformation test is therefore a necessary alternative, although not the only one.

The necessity to still use the machine-or-transformation test brings about unsolved issues pertaining to the practical application of the test. For example, the CAFC stated that tying the implementation of a process to a special or particular machine or apparatus would fulfill the patent-eligibility criterion for the machine part in the machine-or-transformation test. But the CAFC did not address the question of what kind of a machine is needed to fulfill the need for 'special or particular' machine. Is it a specially adapted machine which is devised for carrying out the specific method? Or can any conventional machine suffice?

The transformation part of the test gives rise to similar problems. The reasoning seems to imply that there must be some kind of physical connection to the data and signals present in the method. With reference to the *Abele* case the CAFC held in *In re Bilski* that an X-ray display of body parts would qualify as a physical output. But it is difficult to actually understand the difference between a two-dimensional X-ray picture (physical output and therefore eligible) and tables of financial data (non-physical output, non-eligible). Physical output is of course more straightforward and easily determined when methods are implemented in industrial manufacturing processes, e.g. in *Diehr*, where the process regarded the

152 En banc seating refers to the hearing of a legal case where all judges of a court will hear the case (an entire 'bench'). There are different reasons for court hearing en banc, e.g. involvement of a question of exceptional importance or necessity of overruling a prior holding of the CAFC or a predecessor court expressed in an opinion having precedential status (i.e. if the panel determines that its decision will add significantly to a body of law, it issues a precedential opinion). See the CAFC's Internal Operation Procedures at "www.cafc.uscourts.gov/pdf/IOPs122006.pdf" (2010-06-01).

153 Stern, Richard H., *US Court of Appeals for Federal Circuit clarifies patent eligibility guidelines: In re Bilski*, EIPR 2009, 31(4) 213, p. 217.

vulcanization of rubber. Also, the part where transformation of an article to a different 'state' is very unclear.¹⁵⁴

The *Bilski* decision marks a higher threshold for business method patents in the U.S., a development that shifts the U.S. position somewhat closer to the European approach to computer-implemented business method claims. Nevertheless, while the European approach rests on an interpretation of legal exclusions, the U.S. position must be labeled as a drawback for the earlier more generous judicial interpretation of patentability of business methods and software patents in general.¹⁵⁵

8 Conclusion

There is no doubt that protection of software and business methods is a highly contentious issue. The positions of Europe and the U.S., which have been quite distant from each other, seems to have moved closer to a common more restrictive view, especially considering the recent U.S. developments. The European situation still leaves a number of issues unresolved, and the requirement for technical character is still very elusive. In the U.S., patent applicants will be subject to a refining of the restrictive view on business method patents by the CAFC, as the exact criteria are not yet laid out. The future is thus uncertain and interesting legal developments are expected. The situation in emerging economies will also be interesting to follow, as the protection of software patents still is a matter for national law. If a restrictive view on patentability of computer related inventions prevails, the immediate effect would perhaps be more trade secret protection, which probably would be more problematic for the software industry than the existence of patent rights. Other problems also persist, such as the application of the inventive step requirement to such patent applications, and issues of licensing and open source, to name a few.

¹⁵⁴ *Ibid.*

¹⁵⁵ Stern, Richard H., *US Court of Appeals for Federal Circuit clarifies patent eligibility guidelines: In re Bilski*, EIPR 2009, 31(4) 213, p. 213.