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The prerequisite of "technical" decisive for the patentability of computer-implemented inventions, and the way ahead

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Contents

Summary

Currently, the legal provisions and the administrative practice of the European Patent Organization, the EPO, concerning the patentability of computer-implemented inventions are ambiguous and unclear. The contracting states to the EPO have all reproduced the legal framework, the European Patent Convention, into national law but the administrative practices of the national courts has led to a divergence in case law between the courts of the member states and the case law of the Board of Appeal.

A non-statutory prerequisite of technical character is currently decisive for the patentability of software and business method patents. The interpretation of this prerequisite has varied within the EU and has created uncertainty regarding the scope of patentability for computer-implemented inventions.

For the realisation and proper functioning of the internal market it is vital that the laws and administrative practices of the Members States of the EU are uniform. To achieve this, the European Commission has put forward a Proposal for a Directive on the Patentability of Computer-Implemented Inventions. The public has been consulted on its opinion regarding patents in this area, and roughly two opposing groupings can be seen.

- Those who oppose patents for software, and
- Those who are in favour of software patents but are sceptical or reluctant towards patents for computer-implemented business methods

The Directive is largely similar to the patentability provisions of the European Patent Convention, the EPC. Moreover, the Directive has codified many important decisions by the Board of Appeal.

This paper has focused on the prerequisite of technical character decisive for the patentability of computer-implemented inventions.
Further, the thesis looks at how the national administrative practices deviate from each other and how the proposed Directive is intended to clarify the current ambiguities. The merits of the Directive in combination with the author's own suggestions are evaluated and weighed against economic theory.

Abbreviations

ECJ	European Court of Justice
EC Treaty	Treaty establishing the European Community
EPC	European Patent Convention
EPO	European Patent Organisation
EU	European Union
IP	Intellectual Property
Proposed Directive	Proposal for a Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions, COM/2002/0092 final, Official Journal C 151 E, 25/06/2002 P. 0129-0131.
SME's	Small and Medium size Enterprises
TRIPs	Agreement on Trade-Related Aspects Of Intellectual Property Rights
WIPO	World Intellectual Property Organization

1 Introduction

1.1 The importance of software today and the proposed Directive

Software plays an increasingly important role in our professional and private lives. In 1998, the value of the packaged software industry in the EU was 39 billion Euros.[1] It is believed that each packaged software job creates 2-4 jobs in the downstream economy and 1 job in the upstream economy.[2] The increase in the use of software is reflected in a surge in business methods implemented by computer programs.
The legislation currently dealing with software and business method inventions within the EU, is the European Patent Convention, the EPC, national legislation and the Agreement on trade-related aspects of intellectual property rights, TRIPs.
The case law has evolved quite drastically following the radical increase in the use of software in industry and in the private sphere.

Currently under the EPC, the normal criteria of novelty, inventive step, and industrial application do not apply to inventions for software and computer-implemented business methods. The reason is that a computer program in itself is considered to be something abstract, similar to a mathematical method, which although not patentable as such can be protected as a literary work under Directive 91/250/EEC, given that it is the author's own intellectual creation.
Nonetheless, inventions implemented by computer programs having a technical character are considered to be inventions and if such inventions make a technical contribution to the state of the art, they can be patentable subject to normal patentability criteria.

The term technical is not precise, and the EPO courts have successively taken a more lenient approach towards inventions claiming to fulfil the prerequisite. The EPO, has granted more than 20,000 patents for computer-implemented inventions, which clearly shows that there is no absolute bar on such patents.[3]

As a consequence of the interpretation of the term technical the case law of the European Patent Office, the EPO, has been somewhat unclear and ambiguous on the question of the patentability of computer-implemented

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[1] The Competitiveness of Europe's ICT Markets, Booz Allen & Hamilton for the Dutch Ministry of Economic Affairs, March 2000, page 10, at, http://www.idgl.lu/library/pdf-files/booz-ict-europe-mar2000.pdf, 2004-11-10.
[2] Explanatory memorandum, page 1, Proposal for a Directive of the European Parliament and of the Council on the Patentability of Computer-Implemented Inventions, COM/2002/0092 final.
[3] Explanatory memorandum, proposed Directive COM/2002/92, (pdf), page 2.

inventions. The case law of the contracting states has deviated from the practices of the EPO, and this has resulted in a state of legal uncertainty regarding such inventions within the European Union.

In the USA, the law is more transparent and extensive regarding the patentability of software and business methods, compared to the EPC.

The European Commission put forward its proposed Directive on the Patentability of Computer-Implemented Inventions in June in 2002, in order to remedy the abovementioned problem. The Directive aims at harmonising national patent laws within the Union and thereby making the conditions of patentability more transparent.[4] The proposed Directive was preceded by a round of consultations launched by the Commission in October 2000, and several studies conducted by independent institutes on behalf of the Commission.

The question of the patentability of computer-implemented inventions is widely debated around Europe and in the industrialized world in general. Somewhat simplified, the proponents of software patents are the major software developers and large enterprises, whereas independent developers of software and the Open Source Movement oppose software patents.

1.2 Purpose and method

My purpose is to;

-   look at, the prerequisite of technical character and technical contribution which are decisive prerequisites for the patentability of inventions for computer programs and business methods implemented by such programs.
-   put forward some suggestions on how the current European patent system should be changed, and by taking into account economic theory evaluate the merits of the suggested amendments.

My secondary object is to;

-   examine how the contradicting interests have been met by the proposed Directive.
-   see how potential problems are intended to be solved by the proposed Directive.

The method used in this thesis has been legal dogmatics and law and economics.
When examining the law I have taken my starting point from the legal provisions of the EPC, and then proceeded by studying how they have been interpreted by the courts. Due to the subject, which is of a technical nature,

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[4] Ibid, page 2.

the thesis is largely descriptive, however the examination of the case law of the EPC and of the contracting states is mainly comparative and the major discrepancies are pointed out.

Economic theory is used as a tool for examining potential effects on the market caused by changes to the current patent system, and comments are made from this perspective at the end of the chapters. The chapters dealing with case law have a summary at the end with the most important findings.

1.3 Delimitations

This thesis will not deal with infringement law. Focus is mainly on what kinds of inventions that currently are patentable, or may be patented, under the proposed Directive. I will not deal with the co-decision procedure in Article 251 under which the Directive is being legislated.

This thesis deals mainly with the prerequisite of technical character. This prerequisite is closely related to the question of whether an invention for a computer program or business method has an inventive step, it is therefore inevitable that I also deal with inventive step for such inventions.

The reader should observe that when I refer to the explanatory memorandum in the proposed Directive the COM/2002/92 version is referred to, and when referring to the preamble, the Official Journal C 151 E, 25/06/2002 P. 0129-0131 version is to be consulted.

1.4 Material

The material has largely been case law from the Board of Appeal, but also from national courts. I have used primary sources mainly, except for German case law which I have studied by reference since I don't speak German. The material has also been books and articles on patent law, computers and software. The Internet has been my primary information source for articles and comments on the proposed Directive.

2 Computers, computer programs and the software patent debate

For a better understanding of this thesis it is important to have a fair knowledge of computers and computer programs. The following brief summary should be sufficient for this purpose.

2.1 Source code and object code

I will in this thesis use the word software as synonymous with computer programs. A computer program is "a set of instructions capable, when incorporated in a machine readable medium, of causing a machine having information capabilities to indicate, perform or achieve a particular function, task or result".[5] There are two types of computer programs, application programs and operating programs. Application programs are used for a specific purpose, such as for example Adobe Photoshop. Operating programs control the execution of application programs.[6] Only application programs are of further relevance for this thesis
Computer programs are written in source code. There are a number of languages for writing source code which all have grammar and other features similar to a normal language.[7] The computer can only read the source code in its binary form, when it is converted into object code. The binary form is made up of ones and zeroes.[8]

2.2 Algorithms

An algorithm can be said to be the smallest constituent in a computer program. An algorithm is an instruction to the computer, which consists of a limited number of sequential steps which provide a solution to a problem when followed. Algorithms must be finite; they are not allowed to go on endlessly.[9]

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[5] WIPO, Model provisions on the protection of computer software, Geneva 1978.
[6] Olsson, H., Patentability and Computer Software in the USA and Europe, Chalmers University of Technology, 1996, page 2.
[7] Java and Pascal for example.
[8] Plogell, M., Immaterialrättsliga aspekter på datorprogram, Norstedts juridik AB, 1 edition, Stockholm, 1996.
[9] Olsson, H., page 2.

2.3 Hardware

Hardware is essentially the components of the computer which is not software. It comprises for example, the monitor, key board, mouse, hard drive and printers.

2.3.1 Computer readable medium

Computer readable media are carriers of information, such as USB memory sticks, CD-ROMs and diskettes. These types of media are hardware.

2.4 The software patent debate

The Commission started a consultation process in 1997 regarding the patent system in Europe. The result reflected the lack of consensus among various enterprises and interest groups around Europe on the question of the appropriate level of protection for computer-implemented inventions and prompted the Commission to produce the proposed Directive. Computer-implemented inventions is a term created by the European Commission in the proposed Directive, meaning;

" any invention the performance of which involves the use of a computer, computer network or other programmable apparatus, the invention having one or more prima facie novel features which are realised wholly or partly by means of a computer program or computer programs.[10]

The two groupings are split on the fundamental question of whether patents for computer-implemented inventions will promote economic growth or stifle it.[11]

2.4.1 Copyright and software

Copyright protects the expression and not the idea of a creation or an invention. Directive 91/250/EEC on the legal protection of computer programs, governs the copyright protection of software.
The underlying ideas and principles of a computer program and its interfaces[12] are not covered by copyright protection.[13] Copyright protection does not prevent anyone from creating a new computer program based on the ideas or principles from a non-patent protected existing program.

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[10] Article 2 (a), proposed Directive.
[11] The Patentability of Computer-Implemented Inventions, Consultation paper by the services of the Directorate General for the Internal Market, Annex I, at europa.eu.int/comm/internal_market/en/indprop/comp/softpaten.htm, 2004-10-29.
[12] A user interface is the boundary between the operator of the computer and the software/ hardware.
[13] Explanatory memorandum, Proposed Directive, (pdf), page 8.

The copyright protection is infringed where a substantial part of the source code or object code is copied.

The debate on whether copyright or patents are the most suitable form of protection is in fact a dispute about where the programmer's achievement lies.[14] The opponents of software patents claim that the programming of logical functionalities which comprise the ideas and principles of the program is merely routine work. Whereas, the substantial part of the creation of computer program lies in reconciling the logical functionalities with the other parts of the source code, which expresses the idea, into a well functioning entity.

2.4.2 The opponents

The opponents are chiefly developers and users of Open Source software. One of the strongest advocates of Open Source software and opponents of patents for computer-implemented inventions is the Eurolinux alliance. Eurolinux is a coalition of commercial companies and non-profit associations working to protect a software system based on copyright protection and open source software.

The idea behind Open Source software is that the source code, with which the computer programs are created, is being shared freely. Programs are built and improved simultaneously by developers of Open Source software, and the fruits of their labour are freely accessible to anyone on the Internet. The fact that Open Source software is made public on the net is novelty destroying, so it cannot be patented. Open Source code proponents often face problems from other software companies who claim that there patent rights are being infringed.

The opponents of software patents generally consider copyright to be sufficient and adequate protection of software.[15] They point to the fact that innovation within the field of software is sequential, meaning that it is necessary for innovation and for interoperability that programmers share each others improvements and developments. Further, they consider patents held by larger corporations to be obstacles which hamper innovation and progress for smaller software developers.

A study, focusing on how European SME's, small and medium size enterprises, manage their intellectual property protection[16], conducted on behalf of the European Commission, shows that SME´s in general rely more on copyright and informal methods, such as encryption and passwords, in order to protect their software based products, and are less prone to patent.[17]

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[14] Smets, J., P., Pilch, H., Software patentability with compensatory regulation: A cost evaluation, at http://www.upgrade-cepis.org/issues/2001/6/up2-6Smets.pdf, 2004-11-02
[15] Tang, P., Adams, J., and Paré, D., Patent protection of computer programs, page 15, at http://swpat.ffii.org/papers/tangadpa00/tangadpa00.pdf, 2004-11-10.
[16] Ibid.
[17] Ibid, page 58.

The study concluded that bigger companies used the patent system more than smaller ones, and that the smaller companies perceived the patent system to be complicated. Moreover, the smaller companies felt that they would not have the financial possibility to engage in patent disputes with large companies, if patents were acquired.[18]

The study did not find that SME's oppose software patents in general, but found a reluctance towards using the patent system.

2.4.3 The proponents

The proponents of software patents are mainly the larger corporations with patent portfolios. They are familiar with the patent system and they invest a lot of money in obtaining and defending patents. The abovementioned study[19] finds a clear correlation between company size and the use of the patent system. Existing patent portfolios enable large companies to benefit from patents held by other corporations, by way of cross-licensing. Software products are generally made up of different parts[20], which increase the costs for obtaining adequate patent protection, which the larger firms more likely can afford. The proponents of software patents regard patents as a way of safeguarding their investments, but also as a means of strategically blocking competitors from obtaining patents.

2.5 Patent studies conducted on behalf of the European Commission

Following the consultation process which started in 1997 the Commission had a number of studies conducted on their behalf by different institutes and organizations.

2.5.1 The economics of software patents

A study conducted by The Intellectual Property Institute, London, on behalf of the European Commission, called "The Economic Impact of Patentability of Computer Programs", examined the economic consequences for independent software developers and small and medium size enterprises, SME's under the current patent situation in the EPO.[21]

The study found no evidence that independent software developers have been unduly affected by patents held by large corporations or other software

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[18] Ibid, page 73.
[19] See footnote 11.
[20] For example, the program, its user interface and hardware.
[21] Hart, R., Holmes, P., and Reid, J., The Economic Impact of Patentability of Computer Programs, Intellectual Property Institute, London, at europa.eu.int/comm./internal_market/en/indprop/studyintro.htm.

developers.[22] Further, the study found that the SME's could benefit better from the patent system, since they compared to similar companies in the US, make disproportionately little use of the patent system.[23]

The situation in the US was assessed, where the intellectual property (IP) protection is strong, to see if enhanced IP protection would boost the innovation process in Europe. The study found that especially larger firms have from the 1980's and onwards obtained patents for strategic purposes, in order to block competitors from accessing the market. There was also, not surprisingly, a surge in the number of patent applications, which suggests that patent races take place. The patent race phenomenon is explained below. The study found that there was no clear economic evidence that enhanced IP protection had positive effects on the innovation process in software. In pharmaceuticals and biotechnology, strong IP protection is vital for innovation since heavy R&D investments are required in order to obtain patents.[24]

2.5.2 SME's and improved knowledge of IP protection

A study commissioned by the European Commission's Directorate-General for Enterprise, studied how SME's manage their IP.[25] The main conclusions were that SME's preferred copyright and alternative methods, over patents to protect their IP.

The SME's reluctance to use the patent system was according to the study, not only due to the perceived costly process, but also due to lack of knowledge in detail about the complexities of the system, such as on the question of if, and how, software is patentable and of the legal language[26].

The study concluded that comprehensive informational activities by national governments and the European Commission, directed at small and medium sized firms could help those firms to benefit more from the patent system.

2.6 Economic theory

Economic theory is an effective instrument for examining the effects on innovation and social welfare of tightened or relaxed intellectual property protection. It can serve to indicate to what extent a monopoly right should be awarded. I will here illustrate some of the economic problems of granting monopoly rights, with a focus on the software industry.

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[22] Ibid, page 3.

[23] Ibid.

[24] Arora, A., Fosturi, A., and Gambardella, A., Markets for Technology: Economics of Innovation and Corporate Strategy, Cambridge, MA: MIT Press, 2000.

[25] Tang, P., Adams, J., and Paré, D., Patent protection of computer programs, some of the findings from this study have been dealt with under 2.4.2.

[26] Ibid, page 73.

Intellectual property law aims at finding a balance between the incentives to innovate, namely monopoly rights, and the distribution of the results obtained.

To find a balance between intellectual property rights and monopoly it is necessary to examine whether perfect competition or monopoly is more advantageous to innovation.[27]

In a perfectly competitive market a company without a patent does not generate any profits; it simply recoups its costs. If the company obtained a patent its profits would increase drastically.

In a monopoly situation the same company without an invention is already making a profit, if the company obtains a patent it will increase its revenue but the increase from the patent is smaller than the increase experienced by the company in the competitive market. This means that the monopoly firm has less incentive to innovate.
However if the monopoly market is such that a competitor has the possibility to enter it with a similar less expensive patented product, the company will have incentive to innovate and the two companies in the monopoly market will commence a patent race.

2.6.1 Patent race

When two companies or more enter into patent races a lot of investments are made in research and development, R&D, where there in the end there is only one winner. For society, the imitators' investments in R&D are useless because a patent has already been granted for the equivalent technology.

The optimal investment effort by companies, from a society point of view, is the one that maximizes the difference between the expected social benefit and the corresponding total R&D cost. However, since no firm is excluded from participating freely in the patent race, the number of firms taking part in the patent race and spending money on investments is always higher than the benefits of society.

No firm is prohibited from partaking in the race. Nonetheless there are a number of factors which act as deterrents for some firms, normally the smaller ones. In a market where there are a number of established firms which have the financial, technological or legal know-how it is less likely that the financially weak firms will or can engage in a patent race.
From a society benefit perspective it may be preferable to have fewer partakers in a patent race since the social benefit of the patent is higher

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[27] Lévêque, F., Ménière, Y., The Economics of Patents and Copyright, at http://www.cerna.ensmp.fr/PrimerForFree.htm, 2005-01-06.

when less investments are spent on R&D. However, for the weaker firms it will be increasingly difficult to penetrate and compete on an oligopolistic market.

If the R&D investments required to come up with technology similar to the patent, without infringing it, is high, the patent holder does not need to fear competition and consequently he does not need to grant licenses. If imitation is less costly it may be wise of the patent holder to grant licenses so that competitors are less tempted to imitate. Software patents are not as expensive as patents for pharmaceuticals where huge amounts of money are invested and the products are subject to tough clinical trials.[28]

2.6.2 The tragedy of the anticommons

In a situation where two companies own monopoly rights for a technology which can only be utilized by having access to both technologies, the access to the technology is restricted. The transaction cost for a third party to use the technology is relatively high since the third party must negotiate with two parties, compared to the lesser cost of dealing with one company. Higher transaction costs are one of the detrimental effects of the tragedy of the anticommons, but it has an additional set back. If one company decides to lower its price, the product will sell more and the other company which charges its normal price will also benefit from the price cut without having to lower its price. Therefore, the price charged will be higher than what a single owner would charge, and society as a whole will lose. As a consequence, one monopoly is more preferable from a society benefit perspective compared to an oligopolistic situation.

2.6.3 Incremental inventions and technologies

The innovative progress in most fields of technology is sequential or incremental, this is especially the case for software patents where source code is comparable to blocks which can be used in different computer programs. Patents in this field of technology are therefore built upon one another. One invention borrows from the former and both constitute blocks or bricks of the new software product. Patents can hamper innovation when an area is highly sequential, this is an argument put forward by the Open Source Movement, who argue that the patent system shall not apply to software. For example if a company has managed to obtain a patent for a means of drawing digital maps, competitors may be excluded from coming up with an improvement of that invention for maps which show traffic jams or dangerous spots in the traffic.

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[28] Ibid, page 53.

2.6.4 Patent strategies

Patents granted in information technology and biotechnology more than doubled between the years 1990-2000 in Europe, USA and Japan.[29] Technological progress is one explanation for this surge, however as mentioned above, patents have increasingly been obtained for strategic purposes in order to protect a firm's market share, see 2.4.3.
A recent study examining whether the surge in software patents in the USA have increased R&D incentives, found that those patents do not directly cause a decline in R&D intensity but that the greater use of patents is associated with lower R&D intensity.[30] It was further found that software patents are relatively cheap, this fact in connection with the correlation between a high amount of patents acquired and the low investments in R&D lead the others to conclude that many firms in software obtain patents for strategic purposes.
In the software industry strong patents can lead to standard setting products, which can generate network effects. Network effects are when the value of a product rises as more people use the product. For example, the Internet with only a few thousand users would be almost worthless. This can cause lock-in effects, which is a situation where people are familiar with the product and therefore prefer it over similar competing products. Such a situation is difficult to overcome, it requires the collective abandonment of the product by consumers. Strong patent portfolios can give a firm enough monopoly power so that net work effects arise. Net work and lock-in effects can be reinforced by strong IP protection, in terms of what can be patentable, so that a holder of a strong patent can lock-out competitors. Conversely, competing firms can challenge this by providing free or at least IPR free software and instead making money from the supply of services, or support.

Being first to market can therefore be better than focusing on IPR protection it can also be good to let your competitors imitate, which distracts them from making a better product.

A part from safeguarding a firm's R&D expenditure, a strong patent portfolio is also a powerful bargaining chip and a potent legal weapon. Patent holders can effectively block competitors from entering an area by using different patent strategies.

Blanketing or flooding is a strategy where the aim is to turn an area into a minefield of patents.[31] Patents are obtained for every step in an industrial process, so that competitors are deterred from inventing in that area. This strategy is particularly effective in emerging technologies when uncertainty is high regarding how R&D expenditure shall be invested

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[29] Ibid, page 51.
[30] Bessen, J., Hunt., M., Robert, An Empirical look at Software Patents, at http://emlab.berkeley.edu/users/bhhall/others/BessenHunt%20wp03-17.pdf, 2005-02-06.
[31] O. Granstrand, The Economics and Management of Intellectual Property, Cornwall, Edward Elgar Publishing Ltd., 1999, page 221.

Using the strategy of surrounding, a particularly important patent is surrounded by minor patents. This way the surrounded patent can be effectively blocked even after it has expired[32]. Patents used these manners are often referred to as petty patents or nuisance patents, reflecting the opinion on these "inventions" by engineers.

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[32] Ibid.

3 The criteria of an invention and patentability under the European Patent Convention and TRIPs

3.1 European patents

In 1978, Sweden joined the European Patent Convention, the EPC, which lays down the requirements for the patentability of inventions. Moreover, the Convention strictly regulates the requirements for claim formulation and specification.

All European Union member states are members of the EPC, with the exception of Latvia.[33]

A European patent has the effect of a national patent in the designated states which have adhered to the EPC.[34]
The EPC provides for the filing of oppositions by a third party against a granted patent and for the establishment of Boards of Appeal.
The Board of Appeal deals with appeals and appeals in opposition from the court of first instance, the Examining Division.

The Examining Division must follow the Guidelines for Examination in the European Patent Office. Unless confirmed by a decision of a Board of Appeal the Guidelines are not an authoritative source of law.[35]

An Enlarged Board of Appeal can be established with the purpose of deciding important points of law, it is not an appeal court and a party can only try to convince the Board of Appeal that the matter should be referred to the Enlarged Board.[36]

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[33] Apart from the EU, Liechtenstein, Monaco, Romania, Switzerland and Turkey are contracting states, www.european-patent-office.org/epo/members.htm, 2004-11-04.
[34] Levin, M., Immaterialrätten, en introduktion, Stockholm, Nordstedts juridik, 1 edition, 1999, page 86.
[35] Beresford, K., Patenting Software under the European Patent Convention, London: Sweet & Maxwell, London, 2000, page 22.
[36] No cases concerning the patentability of computer-implemented inventions have so far been referred to Enlarged Board.

3.1.1 Patent applications under the Convention

A patent can be obtained in Sweden either directly at the Swedish Patent and Registration Office, at the European Patent Organization, the EPO or, an international application through the Patent Cooperation Treaty, the PCT.[37] In all three cases, the patent is valid in Sweden subject to Swedish substantive law.

An application for a European Patent shall be written in one of the three official EPO languages, English, French and German.[38] Applications to the EPO are published in the European Patent Bulletin.[39]
When a patent is granted and published in the European Patent Bulletin it will be translated into the other two official languages. A patent can be opposed at the EPO within 9 months from the date of publication.[40]

If a European Patent application is rejected at the highest instance it is not possible to obtain a European patent in any of the EPC member states, whether they are designated or not.[41] If a patent is granted it must be translated into the language of all designated states.[42]

3.2 National law and the EPC

National courts are not bound by the decisions of the Board of Appeal and the Enlarged Board of Appeal. The national courts may merely consider the decisions more or less persuasive, and this fact causes discrepancy of law between the contracting states.[43] Regarding Sweden, it has been said that it is a too small country to uphold principles in patent law deviating from the larger countries in the industrialized world.[44] Great Britain and Germany on the other hand have developed patent principles of their own, which have influenced the EPO and consequently, also the other contracting states.[45]

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[37] Ibid, the PTC is not of further relevance for the aim of this paper.
[38] Koktvedgaard, M., Levin, M., Lärobok i immaterialrätt, Nordstedts Juridik AB, 8th edition, Stockholm, 2004, page 221.
[39] Ibid.
[40] Article 99.1, EPC.
[41] Koktvedgaard, M., Levin, M., page 222.
[42] Ibid, page 222.
[43] Beresford, K., page 21, also, since the national laws and legal traditions of the member states require that their own precedents are respected.
[44] Koktvedgaard, M., Levin, M., page 208.
[45] For example the German core theory.

3.3 The criteria of patentability under Article 52 (1) EPC

Article 52 (1) states that patents shall be granted for inventions which are susceptible of industrial application, which are new and which involve an inventive step. The three prerequisites in article 52 (1) constitute the statutory criteria for patentability. The criterion for industrial application is further explained in Article 57, novelty in Article 54 and inventive step in Article 56.
All contracting states to the EPC have reproduced Articles in 52 (1)-(3) into national law.[46] If a claim is found to be for an invention in accordance with Article 52 (1), it must in addition, fulfil the prerequisites in articles 54, 56 and 57 in order to be patentable.

3.3.1 Novelty

An invention is considered to be new if it does not form part of the state of the art. State of the art art is defined as "everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application".[47]
In the EPC, the applicant who first files an application for the invention is considered to be first one to invent it. In the USA, on the other hand, the person who first invents is seen as the proper inventor regardless of whether he is the first one to file an application or not.

3.3.2 Inventive step

An invention is considered to fulfil the criteria of inventive step, if having regard to the state of the art, it is unobvious for a skilled person. When dealing with computer programs, a person skilled in the state of the art is usually a production team and not a single person.[48]

With respect to obviousness, a solution which follows logically from the prior art in the eyes of a person skilled in the art, is obvious.[49]

3.3.3 Industrial application

Decisive for this Article is whether the invention can be made or used in any kind of industry. Computer-implemented inventions fulfil this criteria, in general.

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[46] Explanatory memorandum, proposed Directive COM/2002/92 final, (pdf), page 6.
[47] Ibid, paragraph 9.3, in decision T 0641/00, Comviq, paragraph 2, it was established that the state of the art should be understood as the state of technology.
[48] Guidelines for examination, Part C Chapter IV, paragraph 9.3.
[49] Guidelines for Examination, Part C, Chapter IV, paragraph 9.4.

3.4 The criteria of an invention under Article 52 (2) and (3) EPC

The normal patentability criteria above are not directly applicable when dealing with patent claims for computer programs or business methods, a fact which I will elaborate on in the following chapter.
In Article 52 (2) items are listed which are not considered to be inventions and are therefore excluded from patentability. The reason is that they are based on mental activities, mathematical methods, or abstract concepts that do not have a technical character. Programs for computers and methods for doing business are listed among these items. Computer programs are included in the list for the reason that they are made up of algorithms, which are mathematical methods, and computer-implemented business methods for the same reason, but also because they are mental activities. Algorithms used in software are mathematical algorithms, which place them within the realm of "mathematical methods". The legislator has decided that monopoly rights should not be awarded mathematical formulas since they are considered to be laws of nature which everyone is at liberty to use. According to Article 52 (3), the exclusion from patentability only applies if the claimed invention relates to the items in Article 52 (2), as such.
I will try to explain how software and business method inventions can be patentable, below.

3.4.1 Technical character

Technical character is an implicit requirement in the EPC, which the claimed subject-matter must have in order to refer to an invention. A claim for a computer program or a business method implemented by said program, not directed at these items as such having a technical character and making a technical contribution, is an invention which is patentable if the criteria in Article 52 (1) are fulfilled.

In the preparatory works to the Swedish patent law the exclusion as such from patentability concerning computer programs and business methods is motivated by the fact that subject-matter which does not have a technical character is not an invention.[50] The protection provided for software by copyright is generally considered as sufficient protection for such items.[51] Computer programs are equated with methods for performing mental acts, which lack in technical character and therefore are not patentable.

When drafting the EPC the member states made it clear that patents should only be granted for inventions which represent a technical progress or technological improvement.[52] It was further stressed that the monopoly right awarded an inventor was the right to exclude others from carrying out

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[50] Proposition 1977/78:1 part A, page 322.
[51] Rosén, J., Swedish Software Law, Juristförlaget, Stockholm, 1995, page 53.
[52] Beresford, K., page 16

certain activities in relation to a physical product or process, whereas such a right would be difficult to enforce in relation to abstract concepts.[53]

In the current form of the Convention, technical character is only mentioned in the implementing regulations.

Rule 27 (1) (a) of the implementing regulations to the EPC, says that, "the description shall specify the technical field to which the invention relates", and further in paragraph (c), that it shall "disclose the invention as claimed, in such terms that the technical problem (even if not expressly stated as such) and its solution can be understood and state any advantageous effect of the invention with reference to the background art". Rule 29 (1) of the implementing regulations says that the claims shall define the matter for which protection is sought, in terms of the technical features of the invention.

The drafters of the EPC considered explaining patentable subject-matter more broadly in Article 52 (2) EPC, and emphasise that, "…a patent does not protect the abstract idea but the practical implementation of that idea in certain forms susceptible of industrial application".[54] However, an agreement could not be reached on the formulation, so the phrase was omitted.

The prerequisite of technical character is somewhat unclear and vague, and some claim that it has never been defined anywhere in the EPC, or in the case law.[55] Some find it remarkable that the there is a patentability criterion in the EPC which is not clearly defined and foresee more problems regarding the criterion as more firms file for software patents.[56] The Danish Organisation for IT Policy concludes after a brief study of the case law of the EPO, that it is totally opaque what technical is.[57]

An example may serve to illustrate what technical character is.
For example, a mathematical method is inherently non-patentable, it does not have a technical character. However, if the method is implemented into a computer which controls an industrial process, such as for example painting chessboards, a technical character is achieved. The process of painting chessboards is clearly technical, there is a clear interaction between physical objects, namely the paint and the chessboards.

It has been said that if there were no list of exclusions under Article 52(2) the interpretation of the language in Article 52(1) would be such as to only

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[53] Ibid.
[54] Ibid, page 13.
[55] Rees, D., Software patents – EPO practice: history and state of play, page 4, at www.ps.uni-sb.de/~tmueller/reestran.pdf, 2004-11-04.
[56] Andréasson, I., Patentering av affärsmetoder och datorprogram, Patent Eye, 2003/4, page 20.
[57] Open letter to the European Parliament by the Danish Organisation for IT-Policy, at http://www.softwarepatenter.dk/aktiviteter/itpol/brev4/view, 2004-12-05.

permit patents on physical processes and physical products having a technical character.[58]

3.5 The TRIPs agreement[59]

The EU and its member states ratified the TRIPs agreement by Council Decision 94/800/EC of 22 December 1994. Proponents of software patents advocate that the proposed Directive should be drafted to be more in line with the TRIPs agreement's provisions on patentability.

3.5.1 The criteria of an invention and patentability under Article 27 TRIPs

Paragraph 1 of Article 27, says that "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.
There is a list of exclusions under Article 27, but it does not refer to software or business method patents.

3.5.2 TRIPs and the EPO

TRIPs clearly provides much more extensive patent protection than the EPC, stating that inventions in all fields of technology shall be patentable. Technical effect, unlike the EPC, is not a decisive criteria for the patentability of software and business method inventions under TRIPs.

In case T 1173/97, the applicant argued that TRIPs was binding upon the Board of Appeal and consequently that the extensive patent protection provided by TRIPs, should be applied by the EPO.

The Board said that TRIPs was only binding on its member states and that the EPO was not a member of the WTO and had not signed the TRIPs agreement.[60]
The Board of Appeal found that TRIPs merely gave a clear indication of current trends[61], but concluded that "…the EPC is the only relevant system of substantive patent law to be taken into account…".[62]

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[58] Beresford, K., page 13.
[59] Agreement On Trade-Related Aspects Of Intellectual Property Rights (1997).
[60] T 1173/97, Reasons for the Decision, paragraph 2.1.
[61] Ibid, paragraph 2.3.
[62] Ibid, paragraph 3.

3.5.3 Comments

The ambiguity on the interpretation of the term technical has the effect that smaller firms without in-house lawyers often perceive software patents to be inherently non-patentable. Considering that European patent system is mainly used by larger corporations for protection of their software products, see 2.5.2, the prerequisite of technical could constitute an obstacle for smaller firms to seek patent protection for their software inventions, since the price of hiring law firms for assessing whether their product is patentable is high and larger firms may claim that there potential patent is infringing on patents held by the larger firm. Given this effect of the current criteria of patentable subject-matter, the society could ironically be better of as a whole, since there currently are no patent races in software. According to economic theory patent races lead to excessive R&D investments without producing sufficient surplus to society.

When the US Patent and Registration Office started taking a more lenient approach towards patents for genes in Biotechnology, the immediate effect was patent races.[63]
In this narrow context, the current uncertainty on the term technical could in fact have some advantageous economic effects.

If the patent system within Europe would evolve towards a more lenient approach on patents for software and business methods similar to TRIPs, there is a potential problem of numerous patents in a sequential field such as software. Aspiring innovators will have increased transaction costs as a result of having to deal with several patent holders having monopoly rights on various blocks of source code, or source code in connection with hardware. According to the tragedy of anticommons in economic theory, such a situation leads to excessive pricing detrimental for consumers.

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[63] Lévêque, F., Ménière, Y., page 56.

4 Computer-implemented inventions and case law

4.1 Definition of computer-implemented inventions

Inventions for computer programs or business methods can be patented if they fulfil the criteria in Article 52 (1)-(3).
Business methods and computer programs constitute computer-implemented inventions. In this thesis, when I discuss business methods I refer to computer-implemented business methods, and I use the term software as synonymous with computer programs. Inventions for business methods are software-implemented inventions for performing economic activities such as buying and selling items, business strategies and marketing techniques. There is a general notion that inventions for computer programs and business methods are non-patentable.[64] As mentioned in the introduction the EPO has in fact granted over 20,000 patents for computer-implemented inventions.

4.2 Scheme for examining computer-implemented inventions

When an application is made for a computer-implemented inventions, the examination of patentability is conducted in the following order.

4.2.1 Does the claimed invention have a technical character?

Computer-implemented inventions that act on physical data (see 5., below) are considered to have a technical effect. It is decisive for a claim that it has a technical character, or else it is not an invention under Article 52 (1). The fact that a computer program controls the electrical processes and circuits in a computer and thereby affects the computer in a technical sense is not sufficient to lend a technical character to a claim for a computer-implemented invention. There must be a further technical effect this was established in cases T 0935/97 and T 1173/97, IBM I and II, such as a computer program that controls an industrial process, file handling occupying less memory space, improved control facilities for the operator of the computer system[65], or software that takes up less memory space in the computer. In summary, a further technical effect can be assumed if the

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[64] Beresford, K., preface.
[65] Case T 0769/92 Sohei.

software acts on physical data. Money, business and text are not physical data, according to the case law of the EPO.

4.2.2 Is the objective problem technical?

The objective technical problem that the invention solves shall be established, this is done with regard to the state of the art at the time of the filing of the application. The question of an objective technical problem serves to tell us whether the invention, which must be technical, solves a technical problem. If the invention solves a technical problem in an unobvious way it fulfils the criteria of inventive step. The technical problem is found by comparing features of the invention with the state of the art. Features of the invention which do not contribute to the solution of the objective technical problem are not relevant for the assessment of inventive step.[66] This can be the case if a feature only contributes to the solution of a non-technical problem, for instance a problem in a field excluded from patentability. In case T 931/95 Pension Benefits System, the invention related to the field of business, rendering the invention non-patentable.

4.2.2.1 Technical contribution

As mentioned above, the claimed invention must make a technical contribution to the state of the art, to be patentable. The criterion of technical contribution was first formulated in case T 0208/84, which stated that, "decisive is what technical contribution the invention as defined in the claim when considered as a whole makes to the known art". The question of technical contribution is inherent in point 2 of the scheme, the assessment of the objective technical problem. Phrasing the question as I have in point 2, is only a matter of choice between looking for an objective technical problem and its solution, or a technical contribution to the known art. The aim and the end result is the same.
I believe that the formulation I have chosen is more illustrative of how and when computer-implemented inventions are patentable, nevertheless, it is helpful to keep the phrase technical contribution in mind as it frequently appears in the case law of the Board of Appeal, and regard it as an identical tool for examining inventive step.

4.2.3 Is the claimed solution obvious?

If the solution provided by the invention is unobvious and the invention is new, it shall be granted a patent. The question of obviousness is not of importance for the purpose of my thesis, therefore I will mainly deal with the first two questions of the scheme, regarding the meaning of the term technical.

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[66] Guidelines for Examination, Part C, Chapter IV, paragraph 9.8.2

4.3 Types of claims for computer-implemented inventions

4.3.1 Method claim

The claim can be directed at the method which the invention implements. For example if an application is made for a method with which a computer program controls an industrial process, such as the packaging of card board boxes, the claim should refer to all the steps of this method. The claim can be formulated as following; "a claim for a means of using a computer program to control the process of manufacturing card board boxes". A method claim is not directed at a device, such as a piece of hardware. Method claims are also called process claims.

4.3.2 Device claim

In the example above a device claim could be included to protect the devices needed to carry out the steps of the claim above. Consequently, it should be directed at the physical apparatus which carries out the process of manufacturing card board boxes, and the computer on which the computer program is run. Device claims are also called system claims.

4.3.3 Computer program product claim

The claim relates to the software, comprising its program code. The claim can be directed at the software in itself or the software loaded on a computer readable medium. The software will execute the method in the claim above, when run on a computer. Software product claims have until recently been considered to be non-patentable but recent case law has changed this, which will be discussed below.[67]

4.4 Case law

As mentioned in the introduction of this thesis over 20,000 patents have been granted for computer-implemented inventions. I have chosen to present only a few of these cases which are important and which have affected the assessment regarding what is technical. The cases from the contracting states show how the case law of those states deviate from each other and from the practice of the EPO. The cases are presented in chronological order, starting with software patents.

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[67] Cases T 0935/97 and T 1173/97, IBM I and II.

4.4.1 Software patents

4.4.1.1 T 0208/84 VICOM, decision of 15 July 1986

The invention concerned a method for digitally processing images and an apparatus for carrying out that method. The claims were a method and a device claim. The invention included a mathematical algorithm, which, using fewer calculations, could process images digitally quicker compared to the state of the art. Moreover, the invention processed the images so that they could be displayed more clearly.

With regard to the method claim, the Board of Appeal stated that,

"even if the idea underlying an invention may be considered to reside in a mathematical method a claim directed to a technical process in which the method is used does not seek protection for the mathematical method as such".[68]

The method was according to the Board technical since the process was carried out on a physical entity (the image in this case) implementing the method, and it resulted in a change in that entity. The change was the enhanced quality of the images, which is not merely an abstract result. A mathematical method for example, would only have produced an abstract result, in numbers.

Regarding the device claim, the Board said that it would seem illogical to only grant protection for the technical process but not for the computer on which the process would be carried out.[69]

Furhter, the Board concluded that, if a computer which does not fulfil the criteria of novelty under Article 54, is programmed with a new computer program, this makes the computer new.

The patent was granted for a technical process controlled by a programmed computer and it did not relate to the computer program as such, thus escaping the exclusion of patentability under article 52 (2). This case paved the way for the patenting of computer programs involving a technical process.

4.4.1.2 T 0026/86 Koch & Sterzel, decision of 21 May 1987

A patent was claimed for an X-ray apparatus connected to a computer and controlled by a computer program. The software not only caused the X-ray apparatus to perform the X-ray scanning, but it also stored information on the hard disk. The claim was for a device claim.

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[68] Reasons for the Decision, paragraph 6.
[69] Reasons for the Decision, paragraph 16.

The patent application was opposed on the grounds that the claim was partly non-technical, the storing of information, and therefore the claim as a whole should be rejected.

The Board of Appeal found that subject-matter having a mix of technical and non-technical features was an invention under the EPC.[70] The Board found that, "…the use of non-technical means does not detract from the technical character of the overall teaching…".[71]

4.4.1.3 T 0204/93 American Telephone and Telegraph Company

The claimed invention referred to a method for generating computer programs from program components written in a more generally usable language, so-called generic specifications.

The claimed invention comprised a device claim, a compiler for performing the translation of source code, and a method device.

The claim was rejected for not having a technical character. The Board found that the claim was directed at the performance of a mental act, since the claim merely was a computer implementation of a programmer's activity.[72]

The Board of Appeal further said that computer program product claims, irrespective of a technical character are not patentable, this finding is of interest for the IBM cases below.

"That computer programs may be useful, or applicable to practical ends, is also not disputed. For instance, a computer may control, under control of a program, a technical process and, in accordance with the Board's case law, such a technical process may be patentable".[73]

"However, computer programs as such, independent of such an application are not patentable irrespective of their content, i.e. even if that content happened to be such as to make it useful, when run, for controlling a technical process".[74]

4.4.1.4 T 0935/97 and T 1173/97, IBM I and II, decision of 1 July 1998

These cases are called IBM I and II. Since the decisions are very similar with regards to the claimed inventions and the decisions of the Board, they will be discussed simultaneously.

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[70] Reasons for the Decision, paragraph 3.4.
[71] Ibid.
[72] Reasons for the Decision, paragraph 3.5.
[73] Reasons for the Decision, paragraph 3.13.
[74] Ibid.

In both cases, the appeal was for a program product claim which had been rejected at the first instance.

The computer program product claim in the twin cases was for a software code stored on a computer readable storage medium.

With regard to technical character, the Board said that the physical modifications of the hardware in the form of, for example, electrical currents which the computer program when run causes, is not sufficient to make the software patentable subject-matter.[75]

The Board stated that technical effect in the above sense must be sought 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".[76]

Moreover, the Board found that such a further technical effect, only was shown when the computer program was run on a computer, but that a computer program in itself could have a potential to produce this effect.[77]

The Board found that it would be illogical to deny a patent for a computer program product with the potential of producing a further technical effect, when a method or device implementing the computer program could be patented.[78]

The Board of Appeal did however not rule on the matter in these cases, since the cases were remitted to the Examining Division.

4.5 Summary of software patents

According to Vicom, both a method and device claim directed at a technical process can be patentable, since they do not refer to the computer program as such.

In Vicom, the invention had a technical character because the process was carried out on a physical entity, and it changed the entity physically.

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[75] T 1173/97 Reasons for the Decision, paragraph 6.2.
[76] Ibid, paragraph 6.4.
[77] Ibid, paragraph 9.4.
[78] Ibid, paragraph 9.8

In Koch & Sterzel, the Board found that the fact that an invention has a mix of technical and non-technical features does not exclude it from patentability.

The American Telephone Company suggested that computer program product claims are not allowed irrespective of technical character.

The IBM twin cases specified what was needed for an invention to achieve a technical effect. A further technical effect must be achieved, it is not sufficient for the software to merely cause electrical currents or similar physical modifications. If the software acts on physical data, such as for example the controlling of an industrial process, a further technical effect can be achieved.

A computer program product claimed in itself or stored on a computer readable medium, which achieves a further technical effect, can be patentable following the two IBM decisions. These decisions increase the scope drastically for the patentability of computer programs. The IBM cases are in clear contrast with case T 0204/93 which state that a computer program cannot be claimed in itself or as a record on a carrier, regardless of technical effect.

4.5.1 Comments

Granting claims for the software in itself would effectively shut out competitors from working on improvements of the invention since the source code as such is patented, the bricks on which cumulative patents could be built is protected. This could hamper innovation which suggests that IP protection is brought too far, when considering the overall economic effects.

4.6 Claims for business methods

In this part, the most important cases from the Board of Appeal and from the member states' courts of the EPO, regarding the assessment of technical when dealing with inventions for business methods are presented. There are two types of computer-implemented inventions for business methods. The first type is an invention referring to a business method which also is also applicable in other areas of use, outside that of pure business. An example could be an invention which closes deals between buyers and sellers on an Internet auction where the supply price matches the demand price, but the invention can also be applicable for Internet dates where the person's profiles match. The second type is an invention which is only applicable in the field of business, the computer program is only acting on business and economic data. I refer to the second type as "pure" business metods.

4.6.1 T 0854/90, Card reader IBM, decision of 19 March 1992

The applicant sought a patent for a self-service machine, capable of identifying authorised users of the machine and permitting said user to carry out transactions on the machine. The machine read and stored information from cardholders not already customers to the service, this can be compared to filling in an application form, but with the invention, the data was transferred automatically. The idea behind the patent was that the machine should accept a card that a potential client already had, so that the client could use the same card for several different machines. This, according to the claimant, would reduce costs normally involved in applying for a magnetic card.

The appellant's claim was directed at the method.

The Board found that the method by which the self-service machine decided whether a card should be authorised or not for use on it, constituted merely a method of doing business, therefore it did not provide a technical contribution.[79] The method did have some technical components, for example the fact that the machine read and stored information, but those components did not alter the fact that the claim was for a business method as such.[80] The Board, in comparison, mentioned that the use of a typewriter to perform a business activity did not change the activity into a technical method.[81]

4.6.2 T 0769/92, Sohei, decision of 31 May 1994

The application was for a computerised administrative system for the management of, inter alia, finance and inventory in a company. The invention can be explained as a kind of management daybook where data was stored on different files. Data concerning different fields of business was made accessible through a unitary format, one user interface[82], whereas previously data was stored on different files, one for each respective field of business.

With one user interface for all types of management, the same screen is always displayed, making the operations more convenient. Claims were made for both the method of operating the computer system, and for the system, a device claim. The computer system included a programmed computer and several hardware units relating to the display of information and to the memory of the system.

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[79] Reasons for the Decision, paragraph 2.3.
[80] Ibid.
[81] Ibid.
[82] See footnote 12 for definition.

The fact, that the invention provided one user interface for several different types of management, required technical considerations and solved an objective technical problem.[83] Since the invention solved an objective technical problem it made a technical contribution to the art, thereby fulfilling the criteria of technical character.

The Board of Appeal examined whether the fact that some aspects of the invention related to business methods, which are excluded subject matter, would render the claim as a whole non-patentable. The Board found that according to decision T 0038/86 a mix of technical and non-technical features can escape the exclusion of patentability, if new, and a contribution to the art can be found in the objective technical problem solved.[84]
The case was remitted to the first instance.

4.6.3 T 1002/92 Pettersson – Queuing system, decision of 6 July 1994

A patent was granted by the Examining Division for a system of determining the queue sequence for serving customers at a number of different service points in places such as stores or banks. The service points comprised a number of devices such as, a turn number allocation unit and different terminals, one for each service point. The terminals sent out signals to an information unit, registering which customer was next in line to be served, and at which service point. The invention was opposed and appealed to the Board.

The claim for the patent was a device claim, comprising various hardware units such as a turn number allocation unit.

The Board rejceted the opponent's view, that the invention concerned a business method as such.

"The claimed apparatus is clearly technical in nature..., and has practical application to the service of customers. The fact that one such practical application of such apparatus concerns the service of customers of business equipment does not mean that the claimed subject-matter must be equated with a method of doing business, as such".[85]

The invention constituted three-dimensional objects, which determined the queue sequence by technical means. The Board found the claimed invention to be clearly technical in nature, and that it solved an objective technical problem. The patent was granted.

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[83] Reasons for the Decision, paragraph 3.6.
[84] Reasons for the Decision, paragraph 3.3.
[85] Reasons for the Decision, paragraph 2.1.

4.6.4 T 0931/95 Pension benefits system, PBS, decsion of 8 September 2000

The claimed invention was a method for calculating an employer's pension costs for each employee. The pension cost of each employee was dependent on a number of factors such as the average age, wage and periodic cost of life insurance of the employee. According to the applicant, this new system would reduce the financial and administrative burdens for both employer and employees and offer more reliable funding schemes compared to the former systems. The claim was made for both a method and an apparatus controlling the pension benefit payments.

The Board of Appeal found that the processing of information and calculation of the employee's pensions was merely of an administrative or financial character.

"Thus the invention does not go beyond a method of doing business as such, therefore, is excluded from patentability under article 52 (2) (c) in combination with article 52 (3) EPC; the claim does not define an invention within the meaning of Article 52 (1) EPC".[86] This outcome was due to the fact that the software did not act on physical data, see 4.2.1.

Further, the Board found that a method, having technical features did not confer a technical character to the method when used for processing purely non-technical information.[87] In the Vicom case in contrast, the method did not merely add information, but produced a technical result, which was the digital enhancement of images.

The method claim was rejected since it according to the Board only involved economic practices and methods of doing business, which are not inventions under article 52 (1).[88]

The apparatus for controlling the system, the device claim, was then considered. The Board took a different approach regarding the apparatus.

"In the boards view a computer system suitably programmed for use in a particular field, even if that is the field of business and economy, has the character of a concrete apparatus in the sense of a physical entity, man-made for a utilitarian purpose and is thus an invention within the meaning of Article 52 (1) EPC".[89]

The Board justified the differentiation between the method claim and the device claim by reference to the excluded items in Article 52 (2) (c).

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[86] Reasons for the Decision, paragraph 3.
[87] Ibid, paragraph 3.
[88] Ibid.
[89] Reasons for the Decision, paragraph 5.

An apparatus in the sense of a physical entity is not mentioned in the exclusion list, whereas "schemes, rules and methods" are non-patentable items in the field of business and economy.[90]

The device claim was however found non-patentable under Article 56 since it was obvious for a person skilled in the art to apply it to the pension benefits system, thus there was no technical contribution.
The appeal was dismissed.

4.6.5 Merrill Lynch's Application (1989) RPC. 561, CA, decision of 28 September 1989, Great Britain

The application related to a data processing system, which provided a market making system for securities transactions. The purpose of the invention was to monitor the trading profits of the market maker. The data processing system comprised software operating a computer and various devices. The claimed invention was for a method and for the devices programmed by the software.

At the Court of Appeal Lord Justice Fox found that it was not sufficient in order to escape the exclusion under Article 52 (2), to merely include the computer program in a computer.[91] He said that there must be some technical advance in the form of a new result, which in the Vicom case was the digital enhancement of images.[92]

Regardless of technical advance, Lord Justice Fox found that the end result of the invention was a method of doing business. Therefore, the claim was not directed at a patentable invention. "If what is produced in the end is itself an item excluded from patentability by section 1(2), the matter can go no further".[93]

4.6.6 Automatic Sales Control- 20W (pat) 8/99 GRUR, decision of 15 June 1999, Germany

The German Federal Patent Court was faced with a claim for a business method. The claim was a method claim, which concerned a digital processing system for controlling sales of a number of goods and services.

The Patent Office rejected the claim since it was exclusively a method of doing business.[94] The German Federal Patent Court however found that the business aspect of the invention was in such close connection to the

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[90] Ibid.
[91] Merrill Lynch's Application, (1989) RPC. 561, CA, page 569.
[92] Ibid, page 569.
[93] Ibid.
[94] Beresford, K., page 184.

technical process that it considered the method claim to achieve a technical character.[95]

The claimed invention was considered to relate to patentable subject matter, but the invention was found to be obvious, and the application was rejected.[96]

4.6.7 Case number 01-157, decision by the Court of Patent Appeals, of 10 October 2002, Sweden

This case was rejected at the first instance and was subsequently appealed by the applicant. The invention concerned a computerised stock market trading system that provided enhanced safety between buyer and seller, a so-called market maker. The applicant filed a claim for the system, a device claim and a method claim for the process of matching bids between buyer and seller. Prior to the invention, two orders were matched if the sale price matched a purchase price. A market maker makes it possible to display a sale price and a purchase price simultaneously, without matching buyer and seller. The problem with the existing market maker according to the applicant was that it matched buyer and seller in certain cases where the spread, the difference between the demand and the supply price, was too big. The invention claimed solved this problem by programming the market maker according to certain limitations or parameters, thus causing the market maker to close deals with the smallest possible spread.

The Swedish Patent Board of Appeals said that the introduction of certain parameters or limitations to the market maker, and by transforming the method of parameters into software, did not confer a technical character on the computerised stock market trading system.[97]

The new method of trading did not represent any changes in the functionality of the computer more than the normal interaction between computer and software. The method claim was rejected.

The Board held that the mere fact that a method for doing business was carried out by technical means, in this case a programmed computer, did not necessarily imply that a technical effect was achieved.[98]

This case is somewhat similar to the EPO case T 0931/95, in which the method claim was not considered an invention, whereas the device claim referred to patentable subject-matter, on the basis that it was a physical apparatus not excluded under Article 52 (2).

The Swedish Patent Appeal Court did however not follow this line of reasoning, and stated that it was immaterial in which shape the claim was formulated, it being in the form of a method or a device claim.[99] The device

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[95] Ibid.
[96] Ibid.
[97] Reasons for the Decision, case number 01-157.
[98] Ibid.
[99] Ibid.

claim like the method did not have a technical character and was not patentable.

4.7 "Pure" business method patents and patents that inter alia, relate to business methods

Following the PBS case, it was found that a device claim which only concerned the field of business was technical.

One had consequently reason to believe that the invention would be granted a patent. Evidently this was not the case.
I will try to explain how "pure" business methods are treated by the EPO below, by applying the Pettersson case to the scheme in 4.2, and by comparing the outcome with the application of the device claim in the PBS case to the same scheme. It is important to keep in mind that an invention is considered technical when the software acts on physical data, and that money and business is not considered to be physical data.

4.7.1 The Pettersson case applied to the scheme in 5.2.

As mentioned in the scheme in 4.2 only point 1 and 2 of the scheme are relevant for the purpose of this thesis, and consequently the cases will only be applied to those points.

The claim was for a device claim.

1.   The claimed invention did have a technical character.

2.   The objective problem was technical, and this conclusion was not changed by the fact that one practical application of the invention was in the field of business.

The device claim in Pettersson had a technical character, since it was a physical apparatus as such not excluded within the meaning of Article 52 (1).

The objective technical problem was in this case determining a queue sequence. The solution to this problem can relate to serving customers in a field of business, such as a bank, but it is equally applicable in for example, a nursing home. There was a technical contribution to the state of the art.

4.7.2 The PBS device claim applied to the scheme in 5.2

1.   The device claim had a technical character

2.   The objective problem was not technical since it related exclusively to the field of business.

The device claim, comprising different types of hardware, was found to have a technical character within the meaning of Article 52 (1).
The objective problem solved lay in the field of economics and therefore the invention could not contribute technically to inventive step.

4.7.3 Claim formulation in order to obtain a business method patent

In my reading of the two cases above, the Board excluded a "pure" business method from patenting in the PBS case, for the reason that the invention merely related to the field of business. There was no technical contribution to the state of the art, seeing as, the field of business is not considered technical.

On the contrary, if the device claim in the PBS case had been applicable also in other areas I sense that it would have been granted. In Pettersson and also in Sohei, the inventions related to, inter alia, the field of business but also other non economic areas. This was probably a crucial difference. It is established case law of the EPO to allow patentability for a mix of technical and non- technical features.[100] The Sohei case was remitted to the first instance, but it was found to achieve a technical contribution.

Following the discussion above concerning "pure" business method patents, an invention needs to be useful in additional areas of use, besides the field of business, since a technical contribution is not achieved if the contribution only lies in the filed of business. For example, a computerised ordering system using radio communication for use in cafés or restaurants could be patented if new, and if it makes a technical contribution. A technical contribution could be achieved, for example by providing a quicker ordering system.

The claims should not be directed towards the method only. It is crucial that a physical apparatus is claimed, following the PBS case.
The importance of a device claim is also confirmed by the Pettersson case.
In summary, claims for "pure" business methods are not patentable under the EPC.

4.8 Summary of business method patents

In Card reader, the invention was rejected for lacking in technical contribution.

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[100] see case T 0026/86.

The claim was for a method by which a machine read and stored information, and the invention was intended for use in the field of business. The invention had some components that were technical, but these features did not alter the fact that the invention related to a business method as such, and was consequently not patentable.

Moreover, there was no device claim, a form of claim which would prove to be permitted more willingly by the Board, in cases Pettersson and PBS.

In Sohei, the technical considerations required to overcome the technical problem resulted in a technical contribution to the art. The invention did not only relate to the field of business, it was applicable in other areas of use as well.

In Pettersson the claim was for a device, which according to the Board was clearly technical in nature. The fact that one practical use of the claimed hardware was in the field of business did not equate the claim with an invention for a business method as such.

In PBS, the method claim was rejected. The claim related exclusively to the field of business and the method only processed non-technical information, therefore it was a claim for a business method as such, lacking a technical character.

The device claim in contrast, constituted patentable subject-matter since it was a physical apparatus. A computer, programmed with software fulfils the criteria of technical character, following this decision. Consequently, a further technical effect does not have to be achieved. The invention was however rejected for the reason that the invention did not provide a technical contribution to the art, thus not fulfilling the criteria of inventive step under Article 56.

4.8.1 Opinions on business method patents

Patents for computer-implemented business methods are widely debated in the software intense parts of the world, not least in the USA where such inventions are patentable, as we will see in the next chapter.
The opinions on the patentability of such inventions differ, some claim that it is a natural progression of the patentability of software, others argue that business methods are bad for business and contrary to the nature of the patent system.
Professor Dreyfuss of the NYU faculty of law says that society clearly needs people to develop new business methods, but she poses the question whether it is right to encourage such developments through the patent system.[101]

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[101] Dreyfuss, R., C., Are Business Method Patents Bad for Business ?, New York University School of Law at, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=219574#PaperDownload, 2005-02-17 page 5.

In her point of view there are mainly two problems with business method patents. Firstly, the quality, such patents are often mundane where the methods are well known before the patentee came up with the idea. The quality of those patents affect the economy since economically weak firms can subsist on the market merely because they hold business method patents. This has the effect, according to her that insufficiencies and incompetence on the market are sustained.[102] Secondly, she considers business method patents to hamper innovation, since the monopoly right is granted on the basis that the inventor has a benefit to gain, whereas patents should be granted because they are favourable for the economy as a whole.[103]

This results in higher costs for society and less overall innovation. Even business method patentees are sceptical about the society benefits of such patents. Interestingly, even proponents of business method patents voice their concerns over those patents. Jeff Bezos, co-founder of Amazon and holder of the Amazon "one click" patent discussed in the following chapter, in an open letter on the Internet calls for a much shorter life time for such patents and emphasises that patent laws should recognize "that business method and software patents are fundamentally different than other kinds of patents".[104]

4.8.2 Comments

The fact that business method and software patents are relatively cheap combined with some indications that patents for business methods do not provide a platform for further innovation implies that society reaps little benefits in terms of fruitful inventions generated by increased innovation. This suggests that business method patents are costly to society whereas the inventor profits greatly from his monopoly right which lasts 20 years.

The incremental sequential nature of software should also be considered in this context. The patentee of a business method is effectively blocking others from using ideas in the source code of the program, with which better inventions from a society perspective, could be generated.

Although an cumulative invention derived from that computer program, may not infringe the business method patent for the reason that the new invention is not covered by the claims of the patentee, it can nonetheless be used as an effective weapon against smaller firms to deter them from using the software.

More importantly business method patents can mean a stop to barrier free entry on the Internet, when a company for example advertises and sells its goods in a certain way on the Internet it may unknowingly infringe a business method patent. Transaction costs would rise steeply for firms wishing to establish and market their products on the Web, needing to find

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[102] Ibid, page 8.

[103] Ibid, page 11.

[104] Bezos, J., An open letter from Jeff Bezos on the subject of patents**, at, http://digitalenterprise.org/ip/open_letter.html, 2005-02-16.

out which patents there are and with whom to negotiate in order to obtain a license.

5   Software and business method patents in the USA

5.1 The US patent system

The USA is almost always ahead of the rest of the world in terms of innovation and commercial progress. For this reason, it can be of interest to look at what is patentable under US patent law, and see if the EU should advance in the same direction.

35 United States Constitution, USC, Section 101, in conjunction with Sections 102 and 103 provide a patent system similar to Articles 54, 56 and 57 of the EPC. There is no list of excluded subject-matter similar to Article 52 (2) EPC, under US law, and further there is no prerequisite of technical character or contribution.

Section 101, states;

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

The Examination Guidelines says that subject matter not within the four categories above relates to "abstract ideas, laws of nature and natural phenomena".[105]
Moreover, "subject-matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable".[106] The criterion of practical application above is similar to the prohibition under Article 52 (3), EPC on patents for software and business methods, as such. There is however no need to look for a technical character achieving a technical contribution in the American patent system. If the claimed subject matter fulfils the criteria in Section 101, it is patentable.
Prior to the Diamond Diehr case which is discussed below, there were some judicially created exceptions to patentability which are the four categories mentioned in the Examination Guidelines above. It was found in the Diamond Diehr case that when a law of nature is performing a function which the patent laws are designed to protect, namely transforming or reducing an article to a different state and thing, the claim satisfies the prerequisites in Section 101.

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[105] Manual of Patent Examining Procedure, M.P.E.P., paragraph 2106 at 2100-5.
[106] Ibid, at 2100-9.

The scope of protection for software is similar to that under the EPC, but the fact that the invention does not need to be technical, makes the US system much more transparent.

Software in itself is not patentable, but software claims are permitted when stored on a carrier.[107] This could mean that the EPC permits more extensive patenting on computer programs in this aspect.[108]

5.1.1 Software patents

The American courts' attitude towards software patents was very restrictive during the 1960's and 70's. Following the Diamond Diehr case in the beginning of the 1980's, there was a drastic change in the approach towards such patents. I will deal with this case, and a subsequent case below which reflect how the patentability of software patents is assessed by US Courts.

5.1.1.1 Diamond Diehr[109]

The invention concerned an improved press that moulded rubber by controlled heating. The press was connected to a computer which calculated factors such as heat and time, indicating to the press when the rubber was perfectly shaped so that the press released the rubber.

The patent was rejected at the U.S Patent and Trademark Office, but it was successfully appealed and subsequently brought to the Supreme Court.

The Supreme Court said that, "…a claim drawn to subject-matter otherwise statutory does not become non-statutory simply because it uses a mathematical formula, computer program or digital computer".[110]

The Supreme Court found that a computer program which physically transforms materials is patentable.

5.1.1.2 In Re Alappat[111]

The invention was an apparatus and a method for creating a smooth waveform display in an oscilloscope. An oscilloscope can be compared to a TV picture tube.

The application was considered to merely relate to a mathematical algorithm and therefore it was rejected by the US Patent and Trademark Office.

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[107] M.P.E.P. at 2100-11, and In re Beaugard, 53 F. 3d 1583 (Fed. Cir. 1995).
[108] Cases T 97/0935 and T 1173, which suggest that a computer program is patentable in itself.
[109] Diamon vs Diehr, 450, US Supreme Court, 175, 209 U.S.P.Q 1, 10 (1981).
[110] Ibid, at 209, U.S.P.Q. 8.
[111] In re Alappat, 33 F3d 1526, 31 U.S.P.Q.2d 1545 (Fed Cir 1994).

The Court found that certain types of mathematical subject matter represent nothing more than abstract ideas which are not entitled to patent protection.[112] However, if the subject matter is reduced to some practical application it can be patentable.[113]

Turning to the facts of the case, the Court said that the invention was not only an abstract idea, but a specific machine which produced a useful, concrete and tangible result.[114]

5.1.2 Business method patents

Although software patents became patentable in the early 1980's, patents for computer-implemented business methods were granted first in the late 90's.
The landmark case is the State Street case, which clarified that business methods are patentable in the US and opened the gates for such patents.

5.1.2.1 State Street Bank & Trust Co. v. Signature Financial Group Inc.[115]

The invention was a method claim concerning a data processing system for providing certain financial services. State Street wished to obtain a license from Signature for the use of the data processing system, the negotiations failed between the parties and State Street brought an action to invalidate the patent.

The data processing system was made up of a number of mutual funds pooled into an investment portfolio organized as a partnership.
The benefits of having an investment portfolio made up by mutual funds is the economies of scale, and by organising it as a partnership, tax advantages are achieved.[116]

The data processing system transformed data through mathematical formulas and produced a share price.[117]

The Court found that the transformation of data whereby a share price was produced, constituted a practical application of a mathematical formula.[118] Judge Rich said that non useful mathematical algorithms which are abstract ideas made up by disembodied concepts or truths, are not patentable,

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[112] Ibid 31 U.S.P.Q.2d at 1556-57.
[113] Ibid.
[114] Ibid .
[115] State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1374 (Fed Cir 1998).
[116] State Street, 149 F.3d at 1370, 47 U.S.P.Q.2d at 1598.
[117] Ibid at 1373, 47 U.S.P.Q.2d at 1601.
[118] Ibid.

whereas in this case the invention produced " a useful, concrete and tangible result".[119]

Software is made up by algorithms and when it is coded it ought to be considered to be an embodiment of the algorithm. The usefulness of a claimed computer program is easily shown by an applicant.

The patent was granted, and the State Street case clarified that business methods are patentable inventions in the USA.

The Court said, "We take this opportunity to lay this ill-conceived exception to rest".[120]

Amazon "one click"[121]

This invention which followed the State Street case related to a method and device claim for an ordering system for purchasing items via the Internet.

A customer, who wishes to buy something from an Internet homepage for the first time, is normally required to submit some information to the server of the homepage and perform various other steps before a purchase is performed.

According to the applicant the invention had some benefits over similar Internet commerce systems which were based on a so-called "shopping cart" model. With the "shopping cart" model the customer is required to perform a number of interactions, namely adding items to a "shopping cart", indicating that the purchase is complete and submitting purchase specific order information which completes the order. According to the applicants this system is cumbersome and time consuming. Moreover, sensitive information is transmitted over the Internet every time a purchase is made.

With the invention, the client receives a customer number after having submitted all relevant information, which authorises purchases on the homepage. All subsequent purchases by the client are performed by simply clicking on the items he wishes to buy, since he is already identified as an authorised user.

This case followed after the State Street case above and confirmed that computer programs used for providing an easily manageable electronic commerce method, whereby customers ordered and received goods, achieved a useful, concrete and tangible result.

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[119] Ibid.
[120] Ibid at 1375, 47 U.S.P.Q.2d at 1602.
[121] Amazon, patent number 5,960,411., granted 28 September, 1999.

6 Proposal for a Directive on the patentability of computer-implemented inventions, and author's suggestions

6.1 The objective of the Directive

The EU Council reached a political agreement on a common position on the Directive, on 18 May, 2004. The text was to be formally adopted by the Council on 21 December, 2004, however Poland swayed[122] and the bill could not be passed for a lack of qualified majority. Once the Council has formally adopted a common position on the wording of the Directive, it will be communicated to the European Parliament for a second reading. If a subsequent agreement can be reached by the EU Council and the European Parliament, the Directive will come into force.

For the proper implementation of the Directive, member states will need to introduce new provisions in their patent laws.

The proposed Directive, states that the protection of computer-implemented inventions by means of patents is an essential element for the realisation of the internal market, and further that the patent rules must be transparent and harmonised in order to maintain and encourage investment in this field.[123] An optimum environment must be safeguarded for developers and users of software in the EU, according to the Directive, in order to sustain the world-wide distribution of computer programs in all fields of technology.[124]

Further the Directive, puts focus on some of the differences that have developed in the case law of the EU member states, and recognises the threat to the harmonisation of patent rules and the internal market this development poses.[125]

A separate body of law will not replace national patent law, the Directive simply clarifies the present legal position and aims at avoiding a development in Europe towards allowing patents for non-patentable methods.[126]

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[122] Poland had in May, 2004 voted in favour of the Directive.
[123] Proposed Directive, Official Journal C 151 E, 25/06/2002 P. 0129 – 0131, Article 1, Preamble.
[124] Ibid, Article 4, Preamble.
[125] Ibid, Article 5, Preamble.
[126] Ibid, Article 14, Preamble.

6.1.1 Copyright and the Directive

Patent and copyright protections are complementary, since copyright aims at the expression, and patents at the ideas and principles underlying creations and inventions. There is therefore no conflict between the proposed Directive and Directive 91/250/EEC on the legal protection of computer programs. Nonetheless, a possible violation can infringe both the copyright and the patent protection.
There are certain exceptions to the Copyright Directive on some acts a person can perform without infringing the rights of the software author. The excluded acts include acts for studying the ideas and principles underlying a computer program and the reproduction and translation of source code if necessary for achieving interoperability. These non-infringing acts are translated to the Directive on the patentability of computer-implemented inventions. However, these acts can only be performed in relation to pre-existing programs where the source code is studied in order to achieve interoperability.[127]

6.2 The Directive

6.2.1 Definitions

Article 2 (a) explains what a computer-implemented invention is, which has been discussed under 4.1.

Article 2 (b) defines technical contribution, as meaning a contribution to the state of the art in a technical field which is not obvious to a person skilled in the art.

This definition is identical to how the term is used by EPO.

Article 3 states that, "Member States shall ensure that a computer-implemented invention is considered to belong to the field of technology".

This Article, maintains the basic EPC principle that only computer-implemented inventions which are technical can be patentable.

6.2.2 Conditions for patentability

Article 4 (1) reproduces Articles 54, 56 and 57 EPC, regarding the criteria for novelty, inventive step and industrial application.

Article 4 (2) says that for the criterion of inventive step to be fulfilled the invention must make a technical contribution.

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[127] Explanatory memorandum, proposed Directive COM/2002/92, (pdf), page 9.

This is in line with how patentability is examined by EPO.[128]

According to Article 4 (3), the assessment of technical contribution is done with regard to the scope of the claim as a whole, which may consist of both technical and non-technical features, and the state of the art.

This Article is in line with the practice of the EPO and the fact that a claim can consist of both technical and non-technical features, establishes the findings of the Board of Appeal in case T 0026/86.

6.2.3 Forms of claims

Article 5, says that the permissible forms of claims are device claims and method claims.

Thus, a claim directed at a computer program in itself or when recorded on a carrier is not permitted. As a consequence, software can only be patented if programmed into a computer or as a method carried out by such computer, or other piece of hardware.

This provision is in stark contrast to the twin IBM cases[129], in which the Board, although remitting the cases to the examining division, found that a computer-implemented invention having a technical character was patentable in itself.
It is clear that the Directive has opted for more restrictive patent rules, which in this case, deviate from the case law of the Board of Appeal.

6.3 The Directive and the European Patent Convention

Seeing as, the Directive is largely consistent with the EPC, the Convention will probably subsist in its current form. The Directive will not have a binding effect on the EPO[130]. However, measures will most likely be taken to ensure that the practice of the European Court of Justice, the ECJ, and courts bound by the Directive evolve in harmony with that of the EPO and its organs. The preliminary rulings under Article 234 EC Treaty by the EC Court will form the case law within the European Union, so there is clearly a need for the EPO and the EC Court to communicate closely. The implementing regulations to the EPC may need to be amended, so that there is a reference to the Directive to safeguard a uniform patent practice. This approach was seen when the Biotechnology Directive came into effect.[131]

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[128] See scheme in 5.2, although the term technical contribution is replaced by the objective technical problem and its solution.
[129] Cases T 1173/97 and T 0935/97.
[130] europa.eu.int/comm/internal_market/en/indprop/comp/02-277.htm, on 2004-11-11.
[131] Ibid.

6.4 Opinions on the Directive

A group of Swedish lawyers and practitioners find the Directive to be
unclear and believe that it will be difficult to enforce. As a consequence
they fear that the articles can be circumvented by clever claim formulation,
thereby permitting extensive software patents.[132] Kim G. Hansen of the law
firm Kromann Reumert in Denmark, considers the Directive to lack
provisions dealing with potential problems which may arise and moreover
argues that the question of patentability of software products poses a
challenge to the patent system, which should have been discussed to a
higher degree in the directive.[133]
A lawyer of Albihns law firm in Sweden finds the Directive to conflict with
the case law of the EPO, since it does no permit software product claims.[134]
He argues that this is a step in the wrong direction as it narrows the scope of
protection for software producers.

6.5 Author's suggestions

I will in this part put forward some additional changes not presented by the
proposed Directive. I mainly agree to the changes suggested in the
Directive, but the Directive is far from a drastic change of the current
situation and I believe that more far-reaching changes are needed on some
aspects discussed below.

6.5.1 Elimination of the term technical

The term "technical" is in my opinion more problematic for SME's which
normally do not have in-house lawyers, and therefore are less cognizant of
the case law derived interpretations and developments concerning the
meaning of this term.

The problem with the term technical as a decisive factor is that the
definition seems to be based on some notion of exactness derived from
physics and not on the role that technology plays in society.

The alternative would be to not have a list of exclusions and thereby
providing for a more flexible system open to future technologies and

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[132] Wallström, P., Pawlo, M., Något om patenterbarhet av datroprogram i svensk rätt, at
http://www.itkommissionen.se/dynamaster/file_archive/030506/e732a7a8ae163f04aa14cf9
dad2d044e/ITOBSRAPP61.pdf, page 6, 2004-11-01.

[133] Hansen, K., G., Kommentar til EU's Forslag til et Direktiv om computer-
implementerede opfindelsers patenterbarhed, Nordiskt Immateriellt Rättsskydd, 2002/6,
page 551.
[134] Andersson, M., Mjukvara som FoU resultat och EU-direktivets begränsning, Patent Eye,
2002/8, page 15.

industrial progress. Article 27 of the TRIPs agreement permits patents for any inventions in all fields of technology, this should be the case under the amended European patent system as well in my opinion. The term practical applicability, which is used in the USA could be used, given that there also is a prohibition on business methods. Further, I believe that this term could be reconciled with the criterion of industrial application under Article 57 EPC.

6.5.2 Prohibition of business methods

The term technical is maintained in the Directive as a decisive prerequisite which the claimed subject-matter must have in order to be a patentable invention.

I believe that this term has some merits regarding the exclusion from patentability of business methods, but I think that business methods can effectively be excluded from patentability by an explicit ban on such patents instead. An outright ban would mean that the term business method needs to be interpreted. This is preferable in my opinion, to dealing with the term technical which seems to give rise to more questions than clarifications. A thorough assessment of business methods could also serve to clarify whether business methods inventions which are not "pure" should be regarded as inventions, a question which the Directive does not provide an answer to.
Business methods inventions unlike software patents do not create a basis from which innovation and future inventions can emerge, seeing as they are merely a means to collect profits. For this reason I think that the amended European patent system should be prohibitively restrictive on such inventions.

6.5.3 Shorter lifetime for software patents

Considering the sequential incremental nature of software and the rapid pace of innovation, I believe that software patents should have a much shorter life span than the current 20 years. This would make it possible for potential innovators to create cumulative inventions. Some propose a life time of only 5 years which I think is reasonable.[135]

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[135] Wallström, P., Pawlo, M.

7 Analysis

The current EPO system, where patents for computer-implemented inventions lack uniform protection within the EU, is clearly problematic. The divergence in administrative practices is possible since the member states are not bound by the decisions of the Board of Appeal.

The legal provisions of the EPC, regulating the patentability in this area are unclear. This is much due to the fact that software and business methods are excluded as such from patentability, which means that positively phrased prerequisites for their patentability has needed to evolve from the case law.

The EPO Boards of Appeals have produced many findings regarding what is not technical but few positively phrased decisions on what it in fact is looking for in that term.
In the twin IBM cases the Board stated that a further technical effect had to be achieved for a claim to have a technical character. This new definition of technical character seemed at first to clarify matters, but at the end of the decision it did in fact make things increasingly unclear.
The Board found a computer program in itself potentially patentable, making it hard to see, what is left of the prohibition under Article 52 (2) of software patents as such.

Technical character has prior to the IBM cases safeguarded that no claims to the computer program as such are granted a patent. However when the Board of Appeal attempted to interpret the term in a coherent way, it found a computer program in itself patentable, making technical character a mighty sword which solves the Gordian knot of the exception to patentability of computer programs as such.
What seems even more puzzling to me, is that such claims are not considered patentable subject matter in the US, where there is no list of exclusion.

An examination of the case law of the contracting states of the EPO show that there are considerable differences within the EU on the assessment of what technical character and contribution are.
The brief overview of claims for business method patents from three EPC and EU member states, shows how the national courts' administrative practices deviate from each other and from the practice of the EPO.
The Swedish case suggests that the Swedish patent courts take a more restrictive stand on claims for business methods compared to the EPO.

The Swedish court did not accept the findings of the Board of Appeal in the PBS case, that a computer, programmed by software has a technical character. The court seems on the other hand to have adopted the prerequisite of "a further technical effect", laid down by the Board in the twin IBM cases. It is possible that a claim drafted so as to demonstrate a

further technical effect achieved, although applicable in the field of business as well, could be patentable.

Merrill Lynch´s application suggests that no claims are patentable in the United Kingdom, irrespective of whether in the shape of method or device claims, where the end result is a method of doing business.

The German practice seems to be the most lenient with respect to business method patents. The claim in the German case dealt with in this thesis, was a method claim, which suggests that the German courts in contrast to the EPO, consider business to be physical data.

In summary, device claims suitably programmed by software are currently of a technical character. Method claims on the other hand, must achieve a further technical effect, which means that it must act on physical data. Money and economics are not considered to be physical data. Computer-implemented business methods are not patentable if the contribution to the art merely lies in the field of business. However, if the claimed invention apart from being applicable for business methods is useful in a non-economic area as well, it can be patented. In other words a technical contribution is not achieved if the contribution only relates to an economic area. Currently, it is possible to obtain a patent for a claim for a computer program in itself, or stored on a carrier.

In the USA patents for computer-implemented inventions do not have to be technical, resulting in a wider scope of patentability for such inventions. The applicant merely needs to show that the claimed invention is of practical applicability. The fact that the term technical is not used has advantages in the form of clearer patent criteria which enables applicants to draft claims more adequately. The flipside to the term "practical application" is that computer-implemented "pure" business methods become patentable as well.

In spite of the fact that the Eurolinux alliance and other supporters of the Open Source Movement have strongly expressed their opposition against software patents, the legislators of the European Union have opted for the patentability of software inventions. It is clear that the EU has drafted the Directive in a manner conducive to private initiative and incentives in the form of monopoly rights, which probably is crucial for technological progress to take place in society. The studies conducted on behalf of the European Commission presented in this paper show on the one hand that there are no clear indications that patents in fact promote innovation in software, but on the other hand that it could not be established that independent software developers had been unduly affected by software patents held by other firms. It was further found, that SME's could by informing themselves better, make better use of the patent system.

Although the studies did not provide any clear cut answers, it is quite clear that the EU legislators believe that enhanced patent protection promotes innovation in Europe. One could say that the programming of logical functionalities in a computer program, as opposed to their form of

expression, is considered by the drafters of the Directive to be the major part of the creation of software.

The Directive will most probably subsist in its current form, it is however possible that the European Parliament, during its second reading considers some amendments, which it wishes to implement.
The proposed Directive is largely a codification of the EPO case law and it does not introduce any drastic changes.

In my opinion, the Directive is a step in the right direction. For a small country like Sweden, the Directive is probably perceived as a welcome clarification of a haphazard situation.
Sweden has not been able to uphold its own patent principles under the EPO, nor has it exerted influence on the administrative practice of the EPO. In contrast, countries like Germany and the United Kingdom have been able to set a standard without actually considering themselves bound by the decisions of EPO. Sweden has therefore, like the other smaller contracting states of the EPC, had to keep up to date on the developments of the administrative practices of the larger member states.
The Directive will have to be implemented by all EU member states into national law. If the courts of the member states' courts are doubtful about the interpretation of the Directive they can, respectively must ask, for a preliminary ruling under Article 234 EC Treaty. The possibility of asking for a preliminary ruling is clearly favourable for the uniform application of the provisions of the Directive. The Commission can by acting as a Community watchdog also safeguard the uniform application of the Directive by monitoring the correct implementation and application of the Directive, under Article 226 EC Treaty. A member states has also the possibility of monitoring that another member state is fulfilling its obligations and can ultimately bring the matter before the Court of Justice, under Article 227 EC Treaty. The uniform patent protection of software will doubtless reduce the transaction costs involved in acquiring licenses from patent holders since,
one patentee will possess the relevant patent for the whole EU market.

However, I fear that the application of the Directive will lead to discrepancies within the EU, due to the criteria of technical character and contribution which have proven difficult for the EPO to interpret in a transparent and clear way. There is a risk of a trial and error situation among applicants, regarding how to formulate their claims in order to demonstrate that their application concerns technical subject matter solving a technical problem.
The forms of claims permitted under the Directive are method claims and device claims, clearly showing that the EU does not agree with the Board of Appeal's reasoning in the twin IBM cases. Claims for a computer program in itself or as a process stored on a computer-readable medium will therefore not be permitted. I believe that it is good that the there is a provision clearly stating this, making the Directive more transparent.

Regarding patents for business methods, the legislators wanted to limit the scope of patentability by codifying the criteria of technical contribution. Consequently, claims for computer-implemented business methods applicable in other areas apart from that of business, will probably be considered as inventions under the Directive, which means that such patents can be obtained by clever claim formulation.

It will in my opinion be a great challenge for the ECJ to formulate clear answers to the member states' courts regarding the term technical, and develop the EC case law in a coherent manner. It seems to me that the ECJ and the EU simply inherits a heavy burden which may not only prove to be cumbersome but also costly in terms of litigation costs, and the time consuming process of cases going to court. This could hamper innovation in software in view of the fact that the Directive, if one is unaware of the difficulties in overcoming the prerequisite of technical, seems to be lenient towards software patents. Considering that software firms in anticipation of the new legislation probably invest substantially in personnel and technology in order to acquire such patens.

Turning to the author's suggestion's, the removal of the term technical could create a surge in patent applications for computer-implemented inventions. SME's would perhaps begin to apply for such patents since there would not be any confusing exceptions to computer-implemented inventions as such any longer. There is a possibility that many firms would acquire those patents for strategic reasons so as to blanket or flood an area so that competitors are at risk of infringing patents if they would attempt to invent in that area. This could clearly be detrimental for smaller software developers who currently are making little use of the patent system. However, the pace of innovation in software is rapid and firms without patents can challenge patented products by providing cheap software and collecting revenue from support instead. The risk of patent races would probably be off-put by the suggestion of lowering the life time of patents to 5 years, discussed below, so that focus instead is directed at putting the products on the market. In addition, this could level the playing field in software between large firms and SME's.

If smaller companies begin to use the patent system more, a few of those firms may be able to penetrate the market and compete with bigger firms which are holding large patent portfolios with products which may have network effects. The smaller firms could break up the lock-in effects of a standard setting product, and consumers would have more choices at competitive prices.

The ban on claims for computer programs as such will see to it that the source code in itself remains non-patentable, which I believe is vital for future developments and innovation in software. Nonetheless, even if such claims are prohibited there is a risk that innovation is hampered as a consequence of extensive patenting of software, considering the incremental sequential nature in this industry. I believe that the open source movement

does have a point in this respect. The tragedy of the anticommons could effectively be solved in an Open Source environment since everything is collectively owned, there are no transaction costs. However, for inventions to take place and for firms to have incentives to innovate there must exist IP protection. An alternative to using the term technical could be to use the formulation of Article 27 of TRIPs, which says that patents shall be available for any inventions in all fields of technology. This suggestion is probably more in line with the traditions of the European patent system, compared to the American criteria of practical application and usefulness. I think that the TRIPs formulation should be adopted, with a few amendments however. There should be a ban on business methods as mentioned and a restriction on the permitted types of claims, so as to exclude computer program product claims. The merit of this suggestion is to avoid wrestling with the term technical.

An explicit ban on business method patents would safeguard that no such patents can be obtained by clever claim formulation which is the case under the current patent system given that the claim does not relate to "pure" business method patents. Granting monopoly rights for business methods would in my opinion be unfavourable for the economy and the innovative climate in Europe. A clear ban would see to it that no firms are spending investments on such from a society perspective, useless patents and would ensure that there is no expenditure on R&D as a consequence of patent races.

R&D investments would perhaps not be so great, since software is much less R&D intense compared to pharmaceuticals or biotechnology, but the expenditure that would occur could have been better spent on other inventions. The granting of business method patents could mean that a number of firms own monopoly rights over different pieces of software all which are necessary for a third party to produce a cumulative invention. This would mean substantial transaction costs for the potential innovator who has to negotiate license deals with various patentees.

Patents for computer-implemented business methods would probably be acquired to a high degree for strategic purposes since they are cheap and effective in terms of shutting out or deterring competitors. Business method patents have little spill over effects on society, and they may even in the long run drastically change the Internet so that firms involved in Internet trading may have to search for patent holders to make sure they don't infringe a patent. This would create unwanted barriers and involve huge transaction costs.

To shorten the life time for software patents would probably have overall positive effects for both consumers and software producers. Considering the ambiguity on the question of whether patents in software promote innovation presented by the studies conducted on behalf of the Commission, I believe this to be a pragmatic approach. A software patent with a life time of 5 years could help to unwind a market with pronounced network effects,

with locked in consumers. It would further give incentives for especially larger firms to focus more on improving their products, in contrast to spending money on patent strategies and the acquirement of petty patents.

In line with this reasoning it would also slow down potential patent races. I think that a shorter life time will be beneficial for the competitive market as well, since firms will be more focused on hitting the market as quickly as possible. This will challenge the holders of patent portfolios and could in turn make it more difficult for firms to produce standard setting products, and give consumers more choices.

Supplement A

Article 52
Patentable inventions

(1) European patents shall be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step.

(2) The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

(a) discoveries, scientific theories and mathematical methods;

(b) aesthetic creations;

(c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;

(d) presentations of information.

(3) The provisions of paragraph 2 shall exclude patentability of the subject-matter or activities referred to in that provision only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.

(4) Methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practiced on the human or animal body shall not be regarded as inventions which are susceptible of industrial application within the meaning of paragraph 1. This provision shall not apply to products, in particular substances or compositions, for use in any of these methods.

Article 54
Novelty

(1) An invention shall be considered to be new if it does not form part of the state of the art.

(2) The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application.

(3) Additionally, the content of European patent applications as filed, of which the dates of filing are prior to the date referred to in paragraph 2 and

which were published under Article 93 on or after that date, shall be considered as comprised in the state of the art.

(4) Paragraph 3 shall be applied only in so far as a Contracting State designated in respect of the later application, was also designated in respect of the earlier application as published.

(5) The provisions of paragraphs 1 to 4 shall not exclude the patentability of any substance or composition, comprised in the state of the art, for use in a method referred to in Article 52, paragraph 4, provided that its use for any method referred to in that paragraph is not comprised in the state of the art.

Article 56
Inventive step

An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art. If the state of the art also includes documents within the meaning of Article 54, paragraph 3, these documents are not to be considered in deciding whether there has been an inventive step.

Article 57
Industrial application

An invention shall be considered as susceptible of industrial application if it can be made or used in any kind of industry, including agriculture.

IMPLEMENTING REGULATIONS TO PART III OF THE CONVENTION

Rule 27
Content of the description

(1) The description shall:

(a) specify the technical field to which the invention relates;

(b) indicate the background art which, as far as known to the applicant, can be regarded as useful for understanding the invention, for drawing up the European search report and for the examination, and, preferably, cite the documents reflecting such art;

(c) disclose the invention, as claimed, in such terms that the technical problem (even if not expressly stated as such) and its solution can be understood, and state any advantageous effects of the invention with reference to the background art;

(d) briefly describe the figures in the drawings, if any;

(e) describe in detail at least one way of carrying out the invention claimed using examples where appropriate and referring to the drawings, if any;

(f) indicate explicitly, when it is not obvious from the description or nature of the invention, the way in which the invention is capable of exploitation in industry.

(2) The description shall be presented in the manner and order specified in paragraph 1, unless because of the nature of the invention, a different manner or a different order would afford a better understanding and a more economic presentation.

Rule 29
Form and content of claims

(1) The claims shall define the matter for which protection is sought in terms of the technical features of the invention. Wherever appropriate claims shall contain:

(a) a statement indicating the designation of the subject-matter of the invention and those technical features which are necessary for the definition of the claimed subject-matter but which, in combination, are part of the prior art;

(b) a characterising portion - preceded by the expression "characterised in that" or "characterised by" - stating the technical features which, in combination with the features stated in sub-paragraph (a), it is desired to protect.

(2) Without prejudice to Article 82, a European patent application may contain more than one independent claim in the same category (product, process, apparatus or use) only if the subject-matter of the application involves one of the following:

(a) a plurality of inter-related products;

(b) different uses of a product or apparatus;

(c) alternative solutions to a particular problem, where it is not appropriate to cover these alternatives by a single claim.

(3) Any claim stating the essential features of an invention may be followed by one or more claims concerning particular embodiments of that invention.

(4) Any claim which includes all the features of any other claim (dependent claim) shall contain, if possible at the beginning, a reference to the other claim and then state the additional features which it is desired to protect. A

dependent claim shall also be admissible where the claim it directly refers to is itself a dependent claim. All dependent claims referring back to a single previous claim, and all dependent claims referring back to several previous claims, shall be grouped together to the extent and in the most appropriate way possible.

(5) The number of the claims shall be reasonable in consideration of the nature of the invention claimed. If there are several claims, they shall be numbered consecutively in Arabic numerals.

(6) Claims shall not, except where absolutely necessary, rely, in respect of the technical features of the invention, on references to the description or drawings. In particular, they shall not rely on such references as: "as described in part ... of the description", or "as illustrated in figure ... of the drawings".

(7) If the European patent application contains drawings, the technical features mentioned in the claims shall preferably, if the intelligibility of the claim can thereby be increased, be followed by reference signs relating to these features and placed between parentheses. These reference signs shall not be construed as limiting the claim.

35 U.S. Constitution

Section 101 Inventions patentable

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.

Section 102 Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless-

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal

representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 (c) of this title before the invention thereof by the applicant for patent, or

(f) he did not himself invent the subject matter sought to be patented, or

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

Section 103 Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Supplement B

Proposal for a Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions.

Article 1

Scope

This Directive lays down rules for the patentability of computer-implemented inventions.

Article 2

Definitions

For the purposes of this Directive the following definitions shall apply:

(a)   "computer-implemented invention" means any invention the performance of which involves the use of a computer, computer network or other programmable apparatus and having one or more *prima facie* novel features which are realised wholly or partly by means of a computer program or computer programs;

(b)   "technical contribution" means a contribution to the state of the art in a technical field which is not obvious to a person skilled in the art.

Article 3

Computer-implemented inventions as a field of technology

Member States shall ensure that a computer-implemented invention is considered to belong to a field of technology.

Article 4

Conditions for patentability

1.   Member States shall ensure that a computer-implemented invention is patentable on the condition that it is susceptible of industrial application, is new, and involves an inventive step.

2.   Member States shall ensure that it is a condition of involving an inventive step that a computer-implemented invention must make a technical contribution.

3.   The technical contribution shall be assessed by consideration of the difference between the scope of the patent claim considered as a whole, elements of which may comprise both technical and non-technical features, and the state of the art.

Article 5

Form of claims

Member States shall ensure that a computer-implemented invention may be claimed as a product, that is as a programmed computer, a programmed computer network or other programmed apparatus, or as a process carried out by such a computer, computer network or apparatus through the execution of software.

Article 6

Relationship with Directive 91/250 EC

Acts permitted under Directive 91/250/EEC on the legal protection of computer programs by copyright, in particular provisions thereof relating to decompilation and interoperability, or the provisions concerning semiconductor topographies or trade marks, shall not be affected through the protection granted by patents for inventions within the scope of this Directive.

Article 7

Monitoring

The Commission shall monitor the impact of computer-implemented inventions on innovation and competition, both within Europe and internationally, and on European businesses, including electronic commerce.

Article 8

Report on the effects of the Directive

The Commission shall report to the European Parliament and the Council by [DATE *(three years from the date specified in Article 9(1))]* at the latest on
(a) the impact of patents for computer-implemented inventions on the factors referred to in Article 7;
(b) whether the rules governing the determination of the patentability requirements, and more specifically novelty, inventive step and the proper scope of claims, are adequate; and
(c) whether difficulties have been experienced in respect of Member States where the requirements of novelty and inventive step are not examined prior to issuance of a patent, and if so, whether any steps are desirable to address such difficulties.

Article 9

Implementation

1.   Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive not later than [DATE *(last day of a month)]*. They shall forthwith inform the Commission thereof.

When Member States adopt those provisions, they shall contain a reference to this Directive or shall be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2.   Member States shall communicate to the Commission the text of the provisions of national law which they adopt in the field covered by this Directive.

Article 10

Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Communities*.

Article 11

Addressees

This Directive is addressed to the Member States.

Done at Brussels,

For the European Parliament   *For the Council*
The President   *The President*

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