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Contents

Summary

This paper attempts to analyse the legal protection of software in Europe and reviews the current legislative developments in the European Union (EU), particularly with regard to the European Council (EC) draft directive for patentability of software-implemented inventions. It analyses the current EU legislation and considers how the proposed Directive improves such legislation and also points to the problematic areas of the proposed draft. With the approach of trying to cover both copyright and patent protection, the paper emphasises the main issues concerning each type of protection, starting with the most significant historical development in the field. While describing the major points of concern, some cases were referred to as well as decisions of Technical Board of Appeal of European Patent Office. The main sources cited are web-based.

Considering that the USA practise in this field is the most developed, some references were to its practice. However, this attempt was only made to show the differences in the legislation between the two regions. Due to lack of space, it was not possible to go into greater detail in the analysis of the comparisons of the two regions. For this reason, a discussion regarding the advantages and disadvantages patent protection of software as such was avoided. Although, many disputes have arisen about the need for patent protection for computer programs, a deep discussion regarding this issue was also not taken up, as it would take up much space. Preference was made instead to concentrate on a discussion of the substantive legal issues. This was also for the belief that this part of the work could be better accomplished than undertaking an analysis of an economic or politic nature.

The second chapter considers legislation on copyright protection of software. It attempts to give a detailed analysis of how computer programs are protected under the terms of the European Council Directive on the legal protection of computer programs (91/250) (Computer Program Directive). The special point of interest was a distinction made between functional and non-functional elements of a program and how copyright law protects them. Other important issues discussed concern actions that are permitted in connection of use of the software without the authorisation of the right holder. These relate, in particular, to a decompilation of computer program; the conditions such actions are deemed as legal and the problems related to such actions.

The third chapter deals with patent protection of software in Europe, particularly under the European Patent Convention (EPC, 1973). Since in the text of the EPC software are excluded from patentable subject matters, but only if "referred to *only to the extent* to which a European patent application relates to such subject matter or activities *as such*" there is a problem in treating software as patentable subject matter as such and thus there is already a number of European patents issued on software and business method. Furthermore, case practice has developed confirming that

patents granted to software shall constitute an invention with a technical character. According to the case law, a technical character may, for example, be present due to the fact that: a *technical effect* is achieved by the claimed subject-matter; *technical considerations* are required to carry out the claimed subject-matter; a *technical problem* is solved by the claimed subject matter; or the claimed subject-matter is explicitly or at least implicitly defined by concrete, *technical means*.

Taking into account the existence of the different approaches regarding the protection of one product, and the controversial issues concerning every type of protection, coupled with the current shift in the software industry regarding the protection of computer programs under patent law and simultaneous discussion of the value of patent protection for software as such, the Draft directive on patentability on computer-implemented inventions has raised many discussions. Therefore, an attempt was made to analyze the Directive and compare its development in the present legal field.

First, attention was paid to solving the problem of the requirement of 'technical character' of new software to be patented. In this regard, the requirement of its definition in Article 2(b) that the technical contribution should be "non-obvious" is confusing. Article 4 states that an "inventive step" (equivalent to non-obviousness) must involve a "technical contribution" and to then state in Article 2 (b) that this technical contribution must itself be non-obvious makes the combination of the two articles a circular statement. Article 2 (b) might be read, as requiring that the technical difference between the invention and the prior art should itself be non-obvious. That would impose a further limitation on what is patentable over and above the practice of the EPO.

Secondly, the interrelation between the Computer Program Directive and the draft Directive was considered as to how the draft could allow actions to be taken without the right holder's authorization, and if that would have a possible harmful extension. A provision is proposed to leave acts permitted under that earlier Directive unaffected (proposed Article 6). The proposal does not clearly set out to extend the "fair use" exceptions for patent infringement to those provided by that earlier Directive (*e.g.* reverse compiling to achieve interoperability), but it might be interpreted that an act that is not a copyright infringing act should also not be a patent infringing act. Such an interpretation would indeed extend the bounds of fair use.

The analysis carried out led to the following conclusions:
The directive does not define the concept of 'technology' and 'technological contribution'; therefore this is left up to the courts. If however the courts have to decide what 'technology' means on a case-to-case basis, the proposed directive fails to meet one of its prime objectives, namely, to reduce confusion on reaching an agreement regarding the technical contribution concept essential for any patent grant.

Moreover, the proposed 'technical contribution' requirement is apparently intended to prevent 'business method' patents. If business method patents were to be categorically excluded, probably it would be more appropriate to prohibit such patents as a category by an explicit legal provision, rather than indirectly by means of a 'technical contribution' requirement.

This European Directive may improve the unity of law, as it is claimed to be one of the purposes of the Directive, as Member states' courts are required to interpret the law in conformity with the Directive, eventually under the supervision of the European Court of Justice. However, the Directive would have no direct legal effect on the European Patent Office. In any case, European Patents, once granted, become subject to national laws, so any patents granted after the Directive took effect and which were inconsistent with its provisions would need to be amended to bring them into conformity (or be revoked). Thus, the directive would not harmonise the grant of European patents by the European Patent Office. Therefore, at best, the proposed directive would reach this objective only in due course as case law is created.

Abbreviations

CIIs	Computer-implemented inventions
CONTU	National Commission on New Technological Uses of Copyrighted Works (USA)
COSAC	Committee of National Parliaments (EU)
EC	European Council
ECIS	European Committee for Interoperable Systems (consisting of smaller firms: ICL, Bull, etc.)
EEC	European Economic Community
EPC	European Patent Convention (1973)
EPO	European Patent Office
EU	European Union
GATT Treaty	General Agreement on Tariffs and Trade, originally created in 1948. At Urugvay Round established WTO system.
GNU	Free software system - GNU's Not Unix that is upwardly compatible with Unix.
FFII	Foundation for a Free Information Infrastructure
HLL	High level language, or third generation of code
NAFTA	North American Free Trade Agreement (1992)
OSI	Open Source Initiative
OSRM	Open Source Risk Management
PCT	Patent Cooperation Treaty
SAGE	Software Action Group for Europe (comprising large firms such as IBM, Microsoft, etc.)
SMEs	Small and medium-sized enterprises
TRIPS Agreement	Agreement on Trade-Related Aspects of Intellectual Property Rights (1994)
UNESCO	The United Nations Educational, Scientific and Cultural Organization
WIPO	World Intellectual Property Organisation
WTO	World Trade Organization
WCT	WIPO Copyright Treaty (1996)
WPPT	WIPO Performances and Phonograms Treaty (1996)
CUE	Computer Users of Europe
CPC	Community Patent Convention
USPTO	United States Patents and Trademark Office

1 Introduction

In July this year the city of Munich announced the biggest ever Windows-to-Linux migration project (named LiMux), covering migration of 14 000[1] desktop and notebook computers from Microsoft Windows and Office software to Linux and Open Office, priced up to 40 million USD[2], and which is not expected to be completed until 2009. The Munich IT installations have been the subject of a fierce battle between Microsoft, on the one hand, and IBM and Linux advocates, on the other.[3] The deal was seen as so significant and embarrassing for Microsoft, that the proposed changeover even got Microsoft personal visit[4] trying to persuade the mayor of Munich in person.[5]

However, the move has been temporarily suspended after about one month mostly over fears that proposed EU legislation could cause the city a huge patent headache[6], that in the result of a patent clash, the city could be forced to pay for extra licensing fees or even shut down its IT systems. Until the risk can be ascertained in greater detail, the city has stopped the bidding-process component of the project, which would role out the migration.[7]

The issue was raised by Green Party Alderman Jens Muehlhaus, who warned that patent issues could bring some of the city's departments to a halt in the future. A threat to that, involving a proposed directive on software patents, is that, patent owner could send a cease-and-desist order against the city of Munich, and furthermore, European patent situation is "a grey area" that should be clarified because of differences in countries and various political parties within those countries voicing varying opinions and approaches to software patents.[8]

According to the Open Source Risk Management (OSRM) Association, Linux may infringe 283 patents. Of the 283 patents 98 are owned by Linux allies, OSRM said, including 60 from IBM, 20 from Hewlett-Packard and 11 from Intel.

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[1] This figure varies from 13 000 to 16 000 in different sources. *See* S. M. Kerner, 'Linux Patent Cloud Blows Over Europe', *Internetnews.com*, 4 August 2004, <www.internetnews.com/dev-news/article.php/3390811>, visited 2004.10.15.

[2] P. Rooney, 'Munich's $40M Linux Migration Job To Be Opened Up For Bid, Begins July 1', 16 June 2004, <crn.com/showArticle.jhtml?articleID=26800043&flatPage=true>, visited 2004.10.23.

[3] *Ibid.*

[4] J. Clarke, 'Can this be true?? Linux migration stopped...', 5 August 2004, <mail.fsfeurope.org/pipermail/fsfe-ie/2004-August/001360.html>, visited 2004.10.23.

[5] Steve Ballmer, Microsoft CEO, interrupted a ski trip in Switzerland a year and a half ago to visit Munich in a last-ditch effort to keep the city's IT operation in the Windows fold.

[6] Under the terms of the European Patent Convention, software patents are not supposed to be allowed in the EU, though there is a large loophole and a move (the EU software patent directive) to formally allow them. *See* Chapter 2, 3 below.

[7] *Supra* note 1.

[8] *Supra* note 2.

Those 283 patents include 27 held by Microsoft[9]. However, the question is left open whether a court would find actual infringement or whether the patent would be ruled invalid. Of patents challenged in court, about half are found to be invalid, Dan Ravicher[10] said.

According to advocacy group Foundation for a Free Information Infrastructure (FFII), there are already more than 30,000 patents in Europe. At the request of a local Munich politician, the FFII conducted a European patent search and found more than 50[11] potential patent conflicts.[12]

Logically, representatives of Linux argue this position of the city, reasoning that such a decision was not more than overreaction. According to Tom Adelstein[13], Munich had plenty of time to study the various patent issues, and unless there was more to the story than is being publicly disclosed, did not need to halt the project at this time. He stated that patents related to Linux belong to the project developers. If the city was worried about that, then they should also worry about Microsoft's patent awards in their own operating system.

The fear of patents, however, did not seem to spell the end of the city's Linux aspirations. According to a press release issued by the local government, Munich was still firmly committed to the Linux migration.[14] Furthermore, meanwhile, Novell's SUSE Linux subsidiary announced it had landed a contract to migrate the server infrastructure of the Norway's second city, Bergen - from Unix and Windows servers to a Linux infrastructure based on SUSE Enterprise Server 8 platform. The deal will affect 50,000 users, according to a statement released by SUSE.[15] Vienna had also been eyeing up a switch but has recently decided to offer a choice of either open source or Windows to half its users from next year, with a review to follow in 2006.[16] The Paris City Council is determined to reduce its dependency on proprietary software suppliers and to phase-in open source operating systems on 17 000 desktops in municipal administration.[17]

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[9] A recently unearthed memo from HP revealed, "basically Microsoft is going to use the legal system to shut down open-source software".
[10] Founder and executive director of the Public Patent Foundation, conducted the analysis for OSRM.
[11] This number varies in different sources up to 80. *See also* M. Banks, 'Munich tests patent validity', *IT Week*, 2 September 2004, <www.vnunet.com/analysis/1157793>, visited 2004.09.28.
[12] *Supra* note 1.
[13] Linux and open source consultant.
[14] *Supra* note 1.
[15] *Supra* note 2.
[16] 'Windows-to-Linux migration in Munich put on temporary hold', *Rainbow Cyber Nuke*, 6 August 2004, <www.rainbowcyber.co.uk/html/modules.php?op=modload&name=News&file=article&sid=407>, visited 2004.10.25, *see also* 'Vienna to offer employees Linux desktops', *DesktopLinux.com*, 11 August 2004, <desktoplinux.com/news/NS9405865885.html>, visited 2004.10.25.
[17] 'Paris migration to Open Source: evolution, not revolution', *eGovernment News*, 13 October 2004, <europa.eu.int/ida/en/document/3382/194>, visited 2004.10.26.

The dispute, which culminated in the year 1998 with the *Street Bank*[18] case, raises lots of considerations and approaches about different systems and their values of software protection. Nowadays, events described above put European region into focus of many observers. One of points of interest is what the draft Directive is about and what development it is more likely to bring to the current state of European legislation.

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[18] In the wake of the decision of the U.S. Court of Appeals for the Federal Circuit, of 23 July 1998, in *State Street State Street Bank & Trust Co.* v. *Signature Financial Group, Inc.*, 149 F.3d 1368, patent applications for business methods have soared. *See* Proposal for a Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions, COM/2002/0092, <europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&numdoc=52002PC0092&lg=LT>, visited 2004.10.27.

2 Current copyright protection for computer programs

There was little need for copyright (or patent) protection for early computer programs. There were few computers, and most software was custom-developed for in-house applications. It was not until the early 1960s that computer programs were being actively marketed by a software industry besides the computer manufacturers. Before widely-marketed software, it was easy to protect by a contract or license agreement any computer program that was being marketed.

While a contract restricted what people receiving the software could do with it, particularly limiting their further distribution of the software, it could not bind people who were not parties to the contract. A person finding a computer program on the street could do anything he or she wanted with it. Copyright law, on the other hand, provides protection for a computer program even when no contract exists.[19]

International legislative developments of copyright protection

Berne Convention and TRIPS Agreement

Due to the inherent difficulties in patenting software among other problems discussed above, legal protection was sought *via* copyright law. Under the primary international copyright convention, the Berne Convention for the Protection of Literary and Artistic Works of 1886[20] (Berne Convention), a degree of unanimity was obtained in the signatories' copyright laws. While not explicitly covering software, it did provide copyright for "literary and artistic works" including "every production in the literary, scientific and artistic domain whatever be its mode or form of expression".[21]

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[19] L. A. Hollaar, *Legal Protection of Digital Information,* 2002, <digital-law-online.info/lpdi1.0/treatise17.html>, Ch. Copyright of Computer Programs, visited 2004.10.29.

[20] The Berne Convention, adopted at Berne in 1886, (last revision of which is the Paris Act of 1971), first established the recognition of copyrights between sovereign nations. It was developed at the instigation of Victor Hugo. The Berne Convention provided that each contracting state would recognize as copyrighted works authored by nationals of other contracting states. Copyright under the Berne Convention is automatic: no registration is required, nor is the inclusion of a copyright notice. The Berne Convention provided for a minimum term of copyright protection of the life of the author plus fifty years, but parties were free to provide longer terms of copyright protection. *See* Berne Convention for the Protection of Literary and Artistic Works, The Fablis Free Online Encyclopedia, *Fablis.com*, 2004, <encyclopedia.fablis.com/index.php/Berne_Convention_for_the_Protection_of_Literary_and_Artistic_Works>, visited 2004.09.21.

[21] Article 2 (1) of Berne Convention states: "The expression 'literary and artistic works' shall include every production in the literary, scientific and artistic domain, whatever may

There are important reasons for choosing copyright protection. First of all, *computer programs are basically writings,* and, under Article 2(1) of the Berne Convention the purpose for which writings are created is irrelevant from the viewpoint of their qualifying as literary works, if they are original intellectual creations. The Berne Convention provided a ready framework for the legal protection of software under copyright law at a time when there was an imperative need for it.[22]

Although computer programs as literal expressions can be protected under copyright, if ideas behind the computer programs embrace technical features providing technical solutions, then the expression of those ideas could be patentable subject matter.[23]

The global acceptance[24] of the Berne Convention argues persuasively for integrating software into the copyright system. However, it *was not unanimously accepted* that computer programs were covered by the phrase "literary and artistic works" in the Berne Convention. It was realized that, even if consensus on the point was reached, revision of the Berne Convention to include computer programs in the list of the works in Article 2 was impractical, and the problem was settled from the international standpoint by including in Article 10 (1) of the TRIPS Agreement[25] (1994)[26] the specific obligation on Members to protect computer programs *as literary*

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be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science.".

[22] A. S. Sequerah, 'A Patent Mess: Developments in the legal protection of software', Programmers and the Law, <www.doc.ic.ac.uk/~nd/surprise_95/journal/vol1/ass/article1.html>, visited 2004.09.21.

[23] *WIPO Intellectual Property Handbook: Policy, Law and Use*, Ch. 7 "Technological and Legal Developments in Intellectual Property", "Brief History of the Protection of Computer Programs", p. 438, <www.wipo.int/about-ip/en/iprm/pdf/ch7.pdf>, visited 2004.09.15.

[24] 157 states are parties to this treaty. *See* 'Status on November 3, 2004', <www.wipo.int/treaties/en/documents/word/e-berne.doc>, visited 2004.09.21.

[25] The World Trade Organization (WTO)'s TRIPS Agreement (the Agreement on Trade-Related Aspects of Intellectual Property Rights), signed in Marrakesh, Morocco on 15 April 1994, came into effect on January 1, 1995, and is multilateral agreement on intellectual property, covering: copyright and related rights, trademarks including service marks, geographical indications including appellations of origin, industrial designs, patents including the protection of new plant varieties, layout-designs of integrated circuits and undisclosed information including trade secrets and test data. The TRIPS Agreement sets *minimum standards of protection* to be provided by Members, specifies domestic procedures and remedies for enforcement of intellectual property rights, and makes disputes about TRIPS obligations subject to WTO dispute settlement mechanisms.

[26] Art. 10(1) of the TRIPS Agreement provides: "Computer programs, *whether in source or object code*, shall be protected *as* literary works under the Berne Convention (1971)".

works under the Berne Convention. The use of the word "as" in the respective provisions of the TRIPS Agreement and the WIPO Copyright Treaty 1996 reflects the view that the instruments should not state that computer programs are literary work.[27]

WIPO study: copyright or *sui generis*

During the 1970s and the first half of the 1980s, intensive international discussions regarding the protection of computer software took place, mainly aiming at resolving the question of whether such protection should be under copyright or patent law, or possibly under a *sui generis* system of protection.[28]

At that time dozens of printed papers existed advocating special treatment of software. Those who thought that existing law should apply to programs focused only on copyright. Opponents claimed that due to the executable nature of programs copyright cannot cover their most characteristic and valuable aspects and therefore was insufficient. Outside the US consensus of professional opinion for special (*sui generis*) law was even stronger. The most official studies on *special protection for software* were performed by WIPO[29] from 1974 to 1985.[30]

WIPO twice prepared a draft treaty to constitute an International Union for the Protection of Computer Software. The first of these drafts was presented in 1976, provided an optional and secret registration and deposit of the software to be protected. Such a register was seen as an instrument of the proof of the existence of a program at certain point of time, and in an accumulation of a pool of freely available software once after the term of protection was terminated. The second draft treaty presented in 1983 no longer included such a register. Both drafts were not accepted.[31]

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[27] J.A.L. Sterling (ed.), *World Copyright Law*, 2nd edition (Sweet & Maxwell, London, 2003) p. 241.
[28] *WIPO Intellectual Property Handbook: Policy, Law and Use, supra* note 23.
[29] WIPO is one of the 16 specialized agencies of the United Nations system of organizations as established by Convention for Establishing the World Intellectual Property Organization from 1967. It administers 23 international treaties dealing with different aspects of intellectual property protection. *See* 'About WIPO', <www.wipo.int/about-wipo/en/>, visited 2004.09.21.
[30] This work lasted from 1974 to 1985 and was initiated by the UN, which asked WIPO to prepare a study on the appropriate form of the legal protection for programs and on measures to facilitate the access of developing countries to information on software. The request was based on the idea that a registration and deposit system could facilitate the dissemination of computer programs *in favour of developing countries*.
[31] J. Halbersztadt, 'Remarks on the Patentability of Computer Software - History, Status, Developments', 14 September 2003, <swpat.ffii.org/events/2001/linuxtag/jh/index.en.html>, visited 2004.09.07.

In February - March 1985 a Committee of Experts convened jointly by WIPO and UNESCO[32] marked a decisive breakthrough in the *choice of copyright* as the appropriate form of protection of computer programs, which can be assimilated to literary works. A few months later, several countries passed legislation clarifying that computer programs were considered works, subject to copyright protection, and since then it has been generally accepted worldwide that copyright protection should be applied rather than a *sui generis* approach.[33]

WIPO Model Provisions on the protection of Computer Programs

In the meantime WIPO produced a proposal that was not accepted as well but triggered to certain extend the preparedness to accept copyright protection for software. WIPO published in 1978 the *Model Provisions on the protection of Computer Programs*, which provide for protection of any form of the expression and exclude the concept, methods or algorithms.

As the condition of the protection, the model provisions required *originality* in the sense that the software must be the result of its creator's own intellectual effort. The protection right should grant to the proprietor the exclusive right to copy, disclose, distribute and use the computer software, and also the right to derive from a program or from detailed program description, another program. On the other hand the protection does not cover independently created software that turn out to be similar to software of another proprietor. The model provisions did not provide for any formalities as a condition of protections.[34]

In a pure sense, the Model Provisions have never been implemented. They had however strong influence in defining the software elements for which protection was defined though copyright system, and to some extent superseded by TRIPS and WIPO Copyright Treaty, and the EC Computer Programs Directive.[35]

WIPO Copyright Treaty

The WIPO Copyright Treaty (1996)[36] (WCT Convention) is a special copyright agreement, which updates the Berne Convention. The work program started in 1989. This process was known as the "Berne Protocol",

since it was conceived as a mechanism to modernize the Berne Convention without engaging in its full revision of the Convention.

The original purpose was to make explicit in the Berne Convention that computer programs and databases are protected as copyright subject matter, and generally to update the Convention concerning use of copyrighted works in a digital and electronic environments.

The work resulted in providing strong links to the Berne Convention. Article 4 of the of the WCT Convention[37] makes clear that computer programs are protected as literary works under Article 2 of the Berne Convention, whatever may be the mode or form of their expression.[38] This declaration finds its comparative provision in Article 10 (1) of the TRIPS Agreement, which provides that computer programs, whether in source or object code, shall be protected *as literary works* under the Berne Convention.[39]

The distinction in the wording between the two instruments ("are protected" in the WCT Convention and "shall be protected" in the TRIPS Agreement) reflects the debate on whether computer programs are, even without special declaration, protected under Article 2 of the Berne Convention. A declaration in the WCT Convention that computer programs "shall be protected as" literary works under Article 2 of the Berne Convention could be interpreted to mean that such programs are not protected but would be protected for the WCT provision thereof. The Agreed Statement[40] concerning Article 4 declares that the scope of protection for computer programs under this Article, read with Article 2, is consistent with Article 2 of the Berne Convention, and on par with the relevant provision of TRIPS Agreement.[41]

Whatever theoretical objections may be raised against the inclusion of computer programs in the same category of protection as traditional literary works, the provision of the WCT Convention and of the TRIPS Agreement confirm that computer programs are now ingrained under the auspices of author's rights.[42]

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[37] Text of WCT referred as available at <www.wipo.int/clea/docs/en/wo/wo033en.htm#P57_5418>, visited 2004.09.23.

[38] Helms, 'Report on WIPO Copyright treaty (WCT) (1996) and WIPO Performances and Phonograms Treaty (WPPT) (1996)', 14 October 1998, <www.ipmall.info/hosted_resources/lipa/copyrights/WIPO%20COPYRIGHT%20TREATY.pdf>, visited 2004.09.23.

[39] Text of TRIPS Agreement referred as available at <www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm>, last visited 2004.09.23.

[40] Adopted by the WIPO Diplomatic Conference on certain copyright and neighbouring rights questions on December 20, 1996.

[41] Agreed Statements concerning the WIPO Copyright Treaty, adopted by the WIPO Diplomatic Conference on December 20, 1996, <www.wipo.int/documents/en/diplconf/distrib/96dc.htm>, visited 2004.10.28.

[42] Sterling, *supra* note 27, p. 713.

Regional legislation

At a regional level, the EC Computer Program Directive provides an extensive code of protection for computer programs, obliging Member States to protect such programs by copyright, as literary works within the meaning of the Berne Convention (Article 1 (1)). NAFTA[43] also obliges each Party to protect computer programs as literary works (Article 1705(1)), and the Cartagena Decision[44] 351 includes computer programs in the list of literary, artistic and scientific works to which protection must be granted (Article 4).[45]

EC Computer directive

As a result, at the beginning of the early 1980's, a number of governments in the developed world decided, after extensive lobbying by some (though not all) sections of the software industry that computer software was analogous to the traditional copyright category of an "original literary work of authorship" and hence should be protected as a literary copyright.[46]

The Council Directive on the legal protection of computer programs (91/250)[47] (Computer Program Directive) was adopted on May 14, 1991, with the requirement for implementation in Member States by January 1, 1993. The purpose was to harmonize copyright protection for computer programs throughout the European Union.[48]

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[43] North American Free Trade Agreement (NAFTA), 1992, binds Canada, Mexico and United States. The Agreement contains extensive provisions on matters affecting trade between the three countries, and in Chapter 17 (Articles 1701-1721), with Annex provisions) set out standards of protection of intellectual property. Art. 1705 obliges each Party to protect the works covered by Article 2 of the Berne Convention, including other works that embody original expression within the meaning of that Convention. In particular, computer programs and "creative" compilations of data or other material must be protected (Article 1705 (1)). *See* Sterling, *supra* note 27 p. 751.

[44] The Sub-Regional Integration Agreement of May 26, 1969 (Cartagena Agreement, the Andean Pact) was concluded between Bolivia, Colombia, Ecuador, Peru and Venezuela. The measures to be taken under the Agreement include the harmonisation of economic and social policies and the approximation of national law in the areas concerned. In implementation of the Agreement, Decision 351 of the Commission of the Cartagena Agreement was concluded on December 17, 1993.This Decision provides what is in effect a complete code of author's right and related rights for implementation in the Member countries. Its provision covers among others scope of protection of computer programs and databases. *Ibid.,* p. 752.

[45] *Ibid.,* p. 241.

[46] A. Story, 'Study on Intellectual Property Rights, the Internet, and Copyright', <www.wipo.int/academy/en/research_pub/papers/Copyright/Copyright.pdf>, visited 2004.10.19.

[47] 'The Computer Program Directive', also known as 'Software Directive'.

[48] Text of the Directive referred as available at <europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31991L0250&model=guichett>, visited 2004.10.16.

Acting under pressure from the US[49], the European Commission, at a very early stage in the *Directive's* drafting history, shelved plans for a *sui generis* system of protection for computer programs. Opting instead to protect computer programs by means of the copyright system, the European Commission followed the approach adopted by the US Government pursuant to the recommendations emanating from the 1980 Report of the National Commission on New Technological Uses of Copyrighted Works.[50]

From the time it is now an established case that computer programs, in whatever form their expression (*e.g.* whether in source code form which is understandable to humans, or in object code format which is clear only to computers[51]), will attract copyright protection as literary works "within the meaning of the *Berne Convention for the Protection of Literary and Artistic Works*"[52] (Article 1(1) of the Directive 91/250).

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[49] The Copyright Act of 1976, which became effective on January 1, 1978, made it clear that Congress intended software to be copyrightable. The definition of literary works in Section 101 states that they are: works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied. *See* Hollaar, *supra* note 19.

[50] Under Copyright Act of 1976 was not clear was how much protection Congress intended to give computer programs, and whether there should be special exceptions to the exclusive rights of the copyright owners, as was the case for some other types of works. Because Congress didn't want to further delay the passage of the Act (which had been in the works for about two decades), it appointed the National Commission on New Technological Uses of Copyrighted Works (referred to as CONTU) to report back about computer programs and other new technologies and put a placeholder provision in the Act. CONTU held extensive hearings not only on protection of computer software but also photocopying and computer databases. On July 31, 1978, it transmitted its final report to the President and Congress. Along with other recommendations, CONTU recommended a new definition be added to Section 101 and that Section 117 be replaced. Congress adopted these recommendations as part of a bill (to amend the patent and trademark laws) that became Public Law 96-517 on December 12, 1980. *Ibid.*

[51] The first generation of codes used to program a computer, was called machine language or machine code, it is the only language a computer really understands, a sequence of 0s and 1s that the computer's controls interprets as instructions, electrically. The second generation of code was called assembly language; assembly language turns the sequences of 0s and 1s into human words like 'add'. Assembly language is always translated back into machine code by programs called assemblers.

The third generation of code, was called high level language or HLL, which has human sounding words and syntax (like words in a sentence). In order for the computer to understand any HLL, a compiler translates the high level language into either assembly language or machine code. All programming languages need to be eventually translated into machine code for a computer to use the instructions they contain.

As the end user you do not see the code used to create computer software programs. However, you do use the results and the end product of today's software programming are soft programs that are easy to use by the consumer. *See* M. Bellis, 'The History of Software Programming', *About.com*, <inventors.about.com/library/inventors/blsoftware.htm>, visited 2004.07.31.

[52] E. A. Madden and A. Sashidharan, 'Protecting Software Developers Under US & European Copyright Regimes: Reverse Engineering for Interoperability & Technological Protection   Devices',

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However, there is no definition of "computer program" and no description of the protection to be afforded by copyright, other than the naming of the specific rights mentioned in Article 4 of Directive.[53] Nevertheless, the term "computer program" covers computer programs in any form, including those that are incorporated into hardware.[54] The Directive does not protect logic, algorithms or programming language to the extent that they comprise ideas and principles.[55]

The other essential effect of the Directive, along that giving protection to computer program under the Berne Convention, is to harmonize the standard of the meaning of originality. That standard must be "the author's own intellectual creation".[56] Such a test implies, not just a quantitively higher amount of input that the traditional "sweat of the brow" or "skill, judgment and labour" threshold of common law countries, but qualitively a different kind of input of the author. Merely expending more effort or resources therefore will not suffice. There has to be something personal and intellectual that results in the creation. The originality standard does not mean, however, that the creation itself – the computer program – has to be particularly inventive, novel, sophisticated or efficacious. The recital 8 states that, in considering the issue of originality, no test as to the qualitative or aesthetic merits of the program should be applied.[57]

Non-functional elements

Article 1(2) attempts to give no precise separation of functional from the non-functional elements in computer programs, relying instead on the

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<www.wipo.int/academy/en/research_pub/papers/Turin2001/pdf/Maddanetal.pdf>, visited 2004.09.27.

[53] Article 4 Restricted Acts states:
Subject to the provisions of Articles 5 and 6, the exclusive rights of the right holder within the meaning of Article 2, shall include the right to do or to authorize:
(a) the permanent or temporary reproduction of a computer program by any means and in any form, in part or in whole. Insofar as loading, displaying, running, transmission or storage of the computer program necessitate such reproduction, such acts shall be subject to authorization   by   the   right   holder;
(b) the translation, adaptation, arrangement and any other alteration of a computer program and the reproduction of the results thereof, without prejudice to the rights of the person who alters   the   program;
(c) any form of distribution to the public, including the rental, of the original computer program or of copies thereof. The first sale in the Community of a copy of a program by the right holder or with his consent shall exhaust the distribution right within the Community of that copy, with the exception of the right to control further rental of the program or a copy thereof.
[54] This term also covers (according to Recital 7) preparatory design work for development of the program, or (according to Article 1) preparatory design material.
[55] Recital 13-14 of EC Computer Program directive.
[56] Article 1(3) of the Computer directive states: "A computer program shall be protected if it is original in the sense that it is the author's own intellectual creation. No other criteria shall be applied to determine its eligibility for protection".
[57] G. Tritton (ed.), *Intellectual property in Europe*, 2nd edition (Sweet & Maxwell, London, 2002) pp.326-328.

general idea-expression distinction.[58] The specific reference to ideas and principles underlying a program's interfaces reflects the decision to exclude any possibility that computer interface specifications would come within copyright control and dangerously hobble interoperability of computer programs and equipment.[59]

Therefore interpreting the *Directive*, the component algorithms, structure or the 'look or feel' of a computer program will not be protected by copyright in Europe as they are effectly, non-literal elements which relate more to idea than expression. Nevertheless, following the lateral extension of the boundaries of US copyright law to encompass, in certain instances, protection for non-literal elements[60], it cannot be a surprise that European courts were eventually faced with the question of where to draw the line between protectable expression and non-protectable idea.[61]

There were some cases held by British courts before the adoption of the Directive, which draw that only expressions are accorded for protection, since computer programs already had protection in UK law as literary works under the Berne Convention.

One of the cases is *John Richardson Computers* v. *Flanders[62]*, where Mr. Justice Ferris[63] in particular found in favour with the approach of the US

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[58] Article 1(2) states: Protection in accordance with this Directive shall apply to the expression in any form of a computer program. Ideas and principles, which underlie any element of a computer program, including those, which underlie its interfaces, are not protected by copyright under this Directive.

[59] Outside the EU, some countries rely on the traditional idea-expression distinction to define the scope of protectable subject matter in computer programs, while others, such as Japan, have specifically legislated on the question: Copyright Act Article 10(3) "protection… shall not extend to any programming language, rule or algorithm used for make such program work". P. Goldstein, *International Copyright: Principles, Law and Practice* (Oxford University Press, New York, 2001) p. 179.

[60] The Second Circuit, in its decision in *Computer Associates* v. *Altai* in 1992 has noted that: "as a general matter, and to varying degrees, copyright protection extends beyond a literary work's strictly textual form to its non-literal components. As we have said, "it is of course essential to any protection of literary property . . . that the right cannot be limited literally to the text, else a plagiarist would escape by immaterial variations." *See* Walker, '*Computer Associates International, Inc.* v. *Altai, Inc*., U.S. Court of Appeals, Second Circuit, June 22, 1992, 982 F.2d 693', <digital-law-online.info/lpdi1.0/cases/23PQ2D1241.htm>, visited 2004.09.23.

[61] In view of Circuit Judge Hand in *Peter Pan Fabrics* v. *Martin Werner,* 274 F.2d 487, (2d Cir. 1960) no principle can be stated as to when an imitator has gone beyond copying the "idea" and has borrowed its "expression". Decisions must therefore inevitably be *ad hoc. See* Hand, '*Peter Pan Fabrics, Inc.* v. *Martin Weiner Corp.,* United States Court of Appeals Second Circuit, Jan. 27, 1960, 274 F.2d 487', <digital-law-online.info/lpdi1.0/cases/124PQ154.htm>, visited 2004.09.23.

[62] Former employee of Plf copied user interface & screen displays in software to print pharmacy labels, using different language & code. Court held: consider individual similarities and then look at entirety of copied material to determine if there is substantial copying; filter out common elements dictated by efficiency, external factors and elements

Court of Appeal in the *Altai*[64] decision and noted that as regards English law, the three stop "abstractions test"[65] would not be out of place.[66] On the facts however, the test was not applied.

In *Ibcos Computers* v. *Barclays*[67] the court was not concerned with the non-literal elements of a computer program[68]; nevertheless the judge felt that the correct position a court should take is to examine the work in its entirety. *If the idea which the computer programmer has sought to express is "sufficiently" general, then the "mere taking of that idea will not infringe".*

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from public domain; 3 infringement found – similar line editor, label amendment function, sequences of abbreviations for dosing information. *See* 'What is protectable?' <file:///C:/Documents%20and%20Settings/rwi03gdy/Local%20Settings/Temporary%20Internet%20Files/Content.IE5/I92RSLYR/331,13>, visited 2004.10.16.

[63] He deals with the issue of non-literal infringement and is clear authority for the view that taking non-literal elements of computer programs can, in principle, infringe the copyright subsisting in those programs. *See* C. Reed, 'Computer Law, reviewed *by* Dr. David Bainbridge', 14 July 2004, <www2.warwick.ac.uk/fac/soc/law/elj/jilt/1997_1/bainbridge/>, visited 2004.10.22.

[64] *Computer Associates International, Inc*. v. *Altai*, Inc., 982 F.2d 693, (2d Cir. 1992). *Supra* note 60.

[65] The Abstraction-Filtration-Comparison test proceeds in three stages. In the first stage (*abstraction*), the various items and components of the program codes are identified. In the second stage (*filtration*), each of the abstracted item/components are analysed, in effect to determine whether one or other of "*five disqualifications*" applies, that is, whether the item/component is to be excluded from consideration because it represents a mere idea, or the merger of idea and expression, or is not a part of the creative material of the program, or is dictated by external factors, or is something from the public domain. The court is then left with a number of item/components, which are to be protected, and in the third stage (*comparison*) the court's enquiry as to substantial similarity focuses on whether the defendant copied any aspect of this protected expression, as well as an assessment of the copied portion's relative importance with respect to the plaintiff's overall program. *See* Sterling, *supra* note 27, p. 528.

[66] *Computer Associates v. Altai* was the first to establish a means of determining which non-literal elements of a program can be copyrighted. This case set forth the 'substantial similarity' test for computer program structure, and the famous 'abstraction-filtration-comparison' test. These are tools to identify ideas and expressions. *See* M. J. Coyle, 'Program protection', *Lawdit.co.uk,* <www.lawdit.co.uk/reading_room/room/view_article.asp?name=../articles/Program%20protection.htm>, visited 2004.10.02.

[67] *Ibcos Computers Ltd*. v. *Barclays Mercantile Highland Finance Ltd.* (1994) F.S.R. 275. The facts: Mr. Poole set up a company to market his computer program. On leaving the company, Mr. Poole signed a document 'recognising' that the software belonged to the company. However, when he went to work for a competitor, Mr. Poole claimed that the software still belonged to him. Mr. Justice Jacob had no doubt that as a result (although Jacob did not refer to the concept of 'equitable assignment'), Mr Poole could no longer claim that the software belonged to him. *See* as cited in 'Ownership and assignment of copyright in computer software', *Legal500.com*, source Bristows, <www.legal500.com/devs/uk/it/ukit_032.htm>, visited 2004.10.22.

[68] In the judgment of *Ibcos Computers Ltd*. v. *Barclays Mercantile Highland Finance Ltd*. (1994) Jacob J's mainly obiter criticisms of Ferris J's judgment. The two cases are instantly distinguishable and, together, set out a workable and robust view of copyright in computer programs. *Supra* note 63.

In the other case, *Cantor Fitzgerald International* v. *Tradition (UK) Ltd*.[69] it was considered that "if the 'idea' is detailed, then there may be infringement. It is a question of degree and therefore the judge had affirmed the *general prohibition on the copyrightablility of ideas*. The learned judge did feel however that the degree of originality of an idea would have a bearing on the ease with which a computer program might be infringed. *The more original an idea - the higher the probability of substantiality of copying and hence infringement.*[70]

Reverse engineering

The greatest interest in the Directive was generated by its treatment of *reverse engineering*, or more specifically, the right of a user to derive the source code of a licensed program. Here, two important trends intersected: the legal system's developing protection of aspects of computer programs other than actual code, and the industry's surge towards interoperable or "open" systems.[71]

Now enshrined across two articles[72], the provisions are largely regarded as a compromise position between the stance[73] adopted by a number of powerful software lobby groups: those in favour of comprehensive rights to reverse engineer represented by a group of small software developers, and those in favour of excluding any right or exception for reverse engineering represented by a group of the largest software developers in the sector.[74]

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[69] *Cantor Fitzgerald International* v. *Tradition (UK) Ltd* (1999) Masons CLR 157, 186. Observations on lack of independence of expert witnesses (computer consultant). *See* as cited by S. C. Freedman, 'Some cases on expert witnesses', 1 February 2000, <www.scl.org.uk/papers/html/experts-cases.html>, visited 2004.10.22. *See also* 'Infringement of copyright in software', *Humphreys & Co.,* <www.humphreys.co.uk/articles/software_1.htm>, visited 2004.10.22.

[70] E. A. Madden and A. Sashidharan, *supra* note 52.

[71] However, initial drafts of the Directive were silent on the question of interoperability.

[72] *See* articles 5 and 6 of the Software Directive.

[73] Tritton, *supra* note 57, p. 332.

[74] Two powerful lobby groups developed rival stances on the issue. The first, the ECIS (European Committee for Interoperable Systems, consisting of smaller firms: ICL, Bull, etc.) argued that the Directive should permit reverse engineering on the basis that such would facilitate competition and promote innovation. The other main group, SAGE (the Software Action Group for Europe comprising large firms such as IBM, Microsoft, etc.) took the opposite view, emphasising the proper scope of protection for right-holders. Although the lobbying efforts for and against a liberal right of reverse engineering were often described as a split between the 'American' (IBM, DEC) and Japanese points of view, a significant role was played by 'CUE' or Computer Users of Europe.

The Directive implements an important compromise between competing interests in the area of reverse engineering, stating an EC "industrial policy" of promoting the *growth of open systems*.[75]

Because of the obviously sensitive nature of any authorization to reverse engineer proprietary software, the right is very restricted. It may not be exercised to develop a program that infringes the copyright of the original. Furthermore, the Directive states the overall principle that the permitted reverse engineering may not be interpreted so as to "unreasonably prejudice" the program owner's "legitimate interests" or conflict with the program's "normal exploitation".[76]

Article 6 of the Directive allows the *reproduction* and *translation* of the form of program code, without the consent of the owner, only for the purpose of achieving the interoperability of the program with some other program, and only if this reverse engineering is *indispensable* for this purpose,[77] providing that the several conditions are met[78].

The right to decompile cannot be excluded by contract.[79] No doubt, the committee's intent was to invalidate contract clauses *prohibiting reverse engineering* that is permitted by the Directive. However, it is interesting to note that unlike the case with back-up copies[80], the Directive does not expressly forbid such clauses.[81]

Further, we shall consider these restrictions more in detail.

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[75] 'EC approves "Software Directive" establishing principles of software protection for Europe', *Gesmer Updegrove LLP,* July 1991, <www.gesmer.com/publications/international/3.php>, visited 2004.09.23.

[76] *Ibid.*

[77] *Ibid.*

[78] Article 6(1): The authorization of the right holder shall not be required where reproduction of the code and translation of its form within the meaning of Article 4 (a) and (b) are *indispensable to obtain the information necessary to achieve the interoperability* of an independently created computer program with other programs, provided that the following conditions are met:
(a) these acts are performed by the licensee or by another person having a right to use a copy of a program, or on their behalf by a person authorized to do so;
(b) the information necessary to achieve interoperability has not previously been readily available to the persons referred to in subparagraph (a); and (c) these acts are confined to the parts of the original program which are necessary to achieve interoperability.

[79] Article 9(1) renders null and void any contractual provisions, which attempt to circumvent the decompilation exception in Article 6. Moreover, the Directive also nullifies and renders void any contractual restrictions on a legal users right to: (a) make back-up copies of the computer program where this is necessary to use that computer program; in addition to the right to (b) observe, study or test the functioning of the program by a method of reverse analysis not involving reverse engineering, undertaken with a view to determining the underlying ideas and principles of the software.

[80] Article 5(2) says, that the making of a back-up copy by a person having a right to use the computer program may not be prevented by contract insofar as it is necessary for that use.

[81] Sequerah, *supra* note 22.

The Right to Observe, Study and Test

These actions may be undertaken with a view to uncovering the underlying ideas and elements of the computer, and is clearly broad enough to encompass the process of feeding large amount of test data of varying parameters into a program in the hope that the processed results will enable a skilled programmer to uncover the programming structure/sequence or underlying algorithms of the program.

It could be said that this right to observe, study and test a computer program is a logical extension or application of copyright principles to software works: *copyright does not seek to protect ideas.* Hence to the extent that a program's logic, algorithmic structure, sequences and programming languages used are mere ideas, a computer user should be free to access these. *The Directive does not however provide the computer user with an unrestricted right to access the underlying ideas by any means whatsoever.* The studying and observation of the program can only take place when the user of the program is carrying out the *loading, displaying, running, transmitting or storing* of that program.[82] This list of actions is exhaustive.

Hence, the normal actions associated with reverse engineering *i.e.* the making of reproductions, translations and adaptations are not authorized under this right to observe, study and test. What is permitted is the reverse analysis of a program by "non invasive means" i.e. by means, which do not attempt to decompile the underlying code of the program. The broad rights of software developers under Article 4(a) ensure the ability of developers to have complete autonomy in licensing their products. A limitation on the uses to which a licensee may put a licensed computer program is a common feature. This is certainly the position in the case of bespoke software where the terms of the end-user license will normally be more negotiable than in the case of standard form shrink-wrap licenses[83], which accompany most off-the-shelf

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[82] Article 5(3) of the Directive.

[83] Shrink-wrap licenses derive their name from the fact that they were initially placed beneath the shrink-wrap on the outside of software packages. When you purchase a copy of WordPerfect, for example, you will notice that the packaging of the software, or the envelope inside the box containing the computer disks, have license agreements printed on them, along with a provision stating that opening the envelope or box (or using the software) constitutes acceptance of the terms and conditions of the license.

When software is transferred over the Internet, similar mechanism is employed, as by providing an interactive order form, containing a web-wrap license agreement that requires a purchaser to electronically accept the license terms before the software is transferred.

A mass market shrink-wrap or web-wrap license is different from other contracts in that it is not negotiated by the parties, its terms may not be reviewable prior to purchase, and it requires something other than the offeree's signature to indicate acceptance (such as the act

computer products. The relevance of this autonomy is as follows: The acts of observing, studying and testing can only take place while the user performs the acts of "loading, displaying, running, transmitting or storing the program *which he is entitled to do*". What the user is entitled to do will hence be delimited by the terms of any license agreement. Certainly as we already saw the right to observe, study and test cannot be *contracted out*[84] of, however the licensor may impose specific limits on the use to which the program can be used in the first place. Such a restriction on lawful use will effectively act as an indirect manner in which a developer can prevent the reverse analysis of his computer program.[85]

Decompilation. Exception to Infringement

To restate, acts of decompilation of a computer program for the purpose of exposing the underlying code invariably involves actions, which require the authorization of the software owner (decompilation will involve acts of reproduction, adaptation and translation).

However, in certain cases, an exception from copyright infringement may exist even though the act of decompilation takes place without the consent of the software developer. In

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of opening the software package or envelope containing disks, or running the software, or clicking an "I accept" icon). Typically, the purchaser is given the option of returning the software if it ultimately does not accept the license terms. The terms of a shrink-wrap or web wrap license typically include broad disclaimers of liability and limitations of damages. *See* D. G. Post and D. C. Nunziato, 'Shrink-wrap licenses and licensing on the Internet', 1997, <www.law.gwu.edu/facweb/dnunziato/shrinkwrap.htm>, visited 2004.09.15.

[84] Prior to the introduction of the Directive it was common practice in Europe when licensing computer programs to contractually bind the licensee to an undertaking not to reverse engineer or otherwise access the source code of the program. This practice is still pervasive in the US. As a consequence, and owing to the fact that the US is one of the three largest software-producing nations in the world, US soft ware manufacturers often attempt to bind European purchasers to express limitations on the rights contained in the Directive. The difficulty, which the US producers (and also their European counterparts) face in this practice, concerns the express prohibition on the contracting out of certain provisions of the Directive.

[85] An illustrated example is as follows: Company A purchases a license of a graphics software application to perform certain specialized graphic design functions. The terms of the license provide that the software shall (a) only be loaded on one machine; (b) used only for performing digital photographic editing; and (c) the program shall only be used to execute and read recognized image formats such as JPEG, BMP, GIF etc. The terms of Article 5(3) will only allow Company A to observe, study and test the program to the extent that the "loading, displaying, running, transmitting or storing" actions are involved in the permitted activities listed (a) to (c). Any further actions such as entering test data which goes beyond the actions (a) to (c) will breach the License Agreement. Hence the limitation of the permitted actions will not permit Company A to perform the complete range of tests necessary to achieve the required information of the underlying structure. E. A. Madden and A. Sashidharan, *supra* note 52.

particular the actions amounting to decompilation must: a) have been indispensable to obtain information necessary for the purposes of creating an interoperable product; and b) the person who carries out the decompilation must be an authorized user of the computer program.[86]

The *Directive* does not however allow any interoperable programmer to break open a piece of software as he or she sees fit. There are a number of limitations: *firstly*, the information which is sought must not have been previously readily available. This is quite a far-reaching limitation on the decompilation exception. It is quite common for large software houses to release information on the interface structure of their software. In such cases independent interoperable developers will have no automatic defense for copyright infringement if they go ahead and reverse engineer despite the availability of the necessary interface information. This limitation can operate to the advantage of software developers.

The legislation does not provide that the information, which is already available, *must be the best or most efficient to enable interoperability*. For example a software developer may make available an interface to his program, which may not be the best method of achieving interoperability. In such a case the interoperable developer may not legally decompile the software while at the same time the software developer has retained the competitive advantage by keeping confidential the source code of his program, which will entitle the software developer to reserve the market in the more efficient interoperable product either for himself or for an authorized third party developer who would secure commercial advantage in return for consideration.

The second limitation states that the *decompilation must be limited to the parts of the program, which is necessary to achieve the information necessary for interoperability*. This limitation may prove difficult in certain instances. Very often the interoperable developer may not know which part of the program needs to be decompiled in other to decipher the necessary interface information. In such cases the entire program may need to be decompiled. What this limitation seeks to restrict is excessive decompilation. In many instances the program with which interoperability is desired may be split into a number of separate components, the elements necessary to be decompiled being clearly obvious to the interoperable developer.

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[86] Article 6 of the Directive.

Obviously the decompilation of the components, which do not relate to the interface is superfluous and excessive and would hence be an unlawful act under the *Directive*.

The Directive also categorizes as "decompilation" the *use* of the information, which has been discovered during the reverse engineering. While this activity is not strictly decompilation in the technical sense of that term, the *Directive* provides three limitations on the use of such information[87]:

1) The information cannot be used for goals *other than to achieve interoperability* of an independently created computer program; and
2) The information must *not be disclosed to others* except those who are involved in the interoperability project; and
3) The information must *not be used* for the development, production or marketing of a computer program which is substantially similar in expression to the computer program which is decompiled, or for any other copyright infringing action.[88]

Reverse Engineering & the Law of Confidence

A related question to that concerning the status of the decompilation exceptions concerns whether the *Directive* permits the establishment of a relationship of confidence between a software owner and a legal user under which reverse engineering may be restricted. Article 9(1)[89] also provides the starting point for this analysis.

It is clear that this provision excludes express and implied contractual obligations of confidence under which the lawful user of a computer program is obliged to keep the result of the reverse engineering secret. However, what is less clear is whether an *equitable* obligation of confidence may survive by virtue of Article 9(1).

An equitable obligation of confidence will arise independent of any agreement if the circumstances of the case make it appropriate to impose such an obligation. A key method of determining whether an implied contractual or equitable obligation will exist depends on the purpose for which the

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[87] Article 6(2) of the Computer Program Directive.
[88] E. A. Madden and A. Sashidharan, *supra* note 52.
[89] Article 9(1): Concerning patent rights, trademarks, unfair competition, trade secrets, protection of semi-conductor products or the law of contract. Any contractual provisions contrary to Article 6 or to the exception provided for in Article 5(2) and (3) shall be null and void.

computer software (secret code) was furnished to the recipient. An obligation of confidence on the disclosee will more readily arise if the software was disclosed with a limited purpose such as for evaluation purposes.[90]

An Exhaustive Regime of the Directive

The extent to which the *Directive* provides a codified and exhaustive expression of the instances in which an unauthorized user may reverse engineer a computer program is unclear.

Some commentators argue that the *Directive* is in fact exhaustive and consequently there is no scope for the application of an additional 'fair use' exception as has been enunciated in the US.[91] This renders the European position for software developers much stronger than in the US. Some note that decompilation carried out with a view towards interoperability is necessarily narrower than decompilation undertaken with a view to uncovering, for instance, an unpatented algorithm or an unprotected program sequence. Nevertheless, whether in fact the *Directive* is exhaustive and hence more restrictive cannot be entirely concluded for its wording.

The recitals to the *Directive* provide that its terms will not affect any existing derogation from copyright "under national legislation in accordance with the *Berne Convention* on points not covered by this *Directive*".[92] The *Berne Convention* in turn in Article 9(2) provides the legitimacy for state action in permitting unauthorized reproductions, which do "not conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate

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[90] E. A. Madden and A. Sashidharan, *supra* note 52.

[91] While copyright law grants authors the exclusive right to reproduce and profit from their works, the law recognizes an exception called fair use. Fair use permits consumers' limited personal, non-commercial use of lawfully obtained copyrighted material without prior consent of the copyright owner. It allows you to photocopy parts of books you own and make back-up tapes of movies or music you own onto VHS or cassette tapes. The U.S. Supreme Court has held that fair use is necessary to avoid an irreconcilable conflict between copyright law and the First Amendment's guarantee of free speech. The Digital Millennium Copyright Act (DMCA) passed in 1998 does not expressly prohibit the copying of digital works - only the distribution and use of tools that circumvent copy prevention technologies. *See* 'Now playing: Protect your fair use rights, Protect Fair Use', *E-advocates.com*, <www.e-advocates.com/protectfairuse/consumers/now_playing.html>, visited 2004.11.25.
Fair use of a copyrighted work for purposes of criticism, comment, reporting, teaching, scholarship, or research is not an infringement. In the USA it is considered the following factors: purpose (profit *vs*. non-profit), the nature of the work, the percentage of the portion used in relation to the entire work, the effect of the use on the potential value of the work. *See also* M. Mazer, 'Copyrights, Fair use in the USA', <lists.ibiblio.org/pipermail/pbs/2003-December/016172.html>, visited 2004.25.11.

[92] Recital 29 of the Directive.

interests of the author". Examples of such permitted derogations, which predated the *Directive* include, for example, the fair dealing exceptions to copyright infringement in UK are to a certain extent similar in application to the US fair use exception. The ambit of these express fair dealing exceptions is broad enough to encompass the "right" to decompile computer programs in certain instances.[93] In *Mars UK v. Teknowledge Ltd*.[94] Jacobs J. held that the provisions of the *Directive* were in fact exhaustive.[95]

Conclusions

Despite the long history of computer industry and legislative development on software protection, no internationally agreed definition of "computer program" has yet been established. The definition put forward above from WIPO Model provisions on the protection of computer software has not become a force of law. Among national definition as is in US Act, s. 101[96], the EC Directive does not contain a definition of the term but simply

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[93] In the case of the UK legislation, s. 29(1) of the Copyright, Designs and Patents Act 1988 provides that fair dealing in a work 'for the purposes of research or private study' or even commercial research, would not infringe copyright. Nevertheless, the question of whether the Directive required member states to enact legislation subsuming the pre-existing derogations turns on the interpretation of the clause which reads "points covered by the Directive", i.e. if the pre-existing derogations are explicitly subsumed by the provisions of the Directive. This provision in the recitals has been criticized as unclear as the substantive provisions of the Directive do not state that the exceptions to copyright are without prejudice to preexisting exceptions recognized by national law. Nevertheless, a recent UK case has clarified the uncertainty, albeit in light of the English legislation. *See* E. A. Madden and A. Sashidharan, *supra* note 52.

[94] At the heart of the judgment is the principle that there is nothing wrong in taking something apart to find out how it is made. The question now is how far will that cut into the rights of software houses and other users of encryption? One might reasonably think that encrypting something was a sufficient message to the outside world that the contents were confidential. This judgment clearly states otherwise, and casts doubt on any effective way of imposing confidentiality obligations on a buyer of encrypted goods in the open market (for example, merely affixing a warning notice to the goods).
The judgment is not a licence for competitors to reverse engineer code, learn its workings and obtain a 'springboard' into the market. IP rights such as copyright and patents still operate to prevent that. Nor is it a licence to eavesdrop on and decode encrypted communications - laws such as the Interception of Communications Act prevent that. However, the judgment potentially seriously erodes the additional protection afforded to developers by rights in confidential information. Copyright can only go so far - it protects a particular form of an idea. One's underlying algorithms or methodologies may not be copyrightable or patentable and one may be relying on secrecy to protect them. According to this judgment, by selling equipment containing one's program, it is now fair game for buyers and competitors to unravel the workings and expose one's ideas. *See* 'Are the chips down for the law of confidence?', *Legal500.com*, <www.legal500.com/devs/uk/ip/ukip_036.htm>, visited 2004.10.22.

[95] E. A. Madden and A. Sashidharan, *supra* note 52.

[96] According to text of section 101 Copyright Law of the United States of America and Related Laws Contained in Title 17 of the *United States Code,* "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.

declares that is shall "include programs in any form, including those, which are incorporated into hardware".[97]

However, protecting computer software under the Berne Convention yields several benefits. Most importantly, it extends to software the principle of national treatment, more precisely described as the principle of *non-discrimination against foreigners*[98], and the guarantee of the numerous minimum standards of protection.

Second, using copyright as the primary framework to protect software *preserves competition in the market*. Copyright protects against the theft of intellectual property (i.e., against plagiarism), while national patent law systems (and at the international level) may effectively block competition with a concrete barrier to entry, as right holders may temporarily develop a complete monopoly in a certain technical sector.

Third, copyright protection of software is *consistent with international differences in the construction of patent law*. For example, for primarily historical reasons, the term "technology" is construed more narrowly in Europe that in the United Stated. The European construction has resulted in a *per se* exclusion of software patenting from the European Patent Convention, as we shall see later in this chapter. The intention was to spare European patent law the burden of resolving international disputes concerning the boundaries of software patenting. As a result of these well-intentioned approaches, patent law has developed in a manner at least partially incompatible with the protection of computer software. Consequently, copyright is currently the only viable regime of protection put into operation.[99]

Nevertheless, this area has it's own problem. Besides having no clear description of that computer programs represent, other questions arise in defining boundaries between idea and expression for purpose of granting protection for non-technical elements although there is a common belief and practice that copyright protects only the expression, and in treating allowance of decompilation and making use of its results, there is particularly a prohibition to use such results in any other ways but for purposes of interoperability. To this extend on someone views this may prohibit further development of the industry.

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[97] Sterling, *supra* note 27, p. 241.
[98] Prior to the adoption of the Berne Convention, nations would often refuse to recognize the works of foreign nationals as copyrighted. Thus, for instance, a work published in London by a British national would be protected by copyright in the UK, but freely reproducible by France; likewise, a work published in Paris by a French national would be protected by copyright in France, but freely reproducible in the United Kingdom. *Supra* note 20.
[99] A. d'Amato and D. E. Long (eds.), *International Intellectual Property Law* (Kluwer Law International, 1997) p. 418.

Nowadays with amazingly fast possibilities to infringe copyright, mainly brought by technology development and the world-spread of the Internet, many players of the software industry search for other forms of protection, mainly in the field of patent law, particularly because they bring the strongest protection of a monopoly for 20 years. This field of protection for computer programs shall be considered further below.

3 Current patent protection for computer programs

The essence of the patent system is the award of a monopoly limited by a period of time over the patented article. The benefit of this for successful applications is potentially very financially rewarding. The system is in place to encourage not only improvements in society but also the disclosure of improvements so as to enable others to develop these ideas further once the patent has ended. The very first patent was awarded to Filippo Brunelleschi in Florence in 1421 and by the 17th Century in England, the practice of granting monopolies became so widespread that it became necessary to limit the practice to inventions with the Statute of Monopolies in 1623.[100]

A patent may be contrasted with a copyright in several important ways. A copyright typically covers only the *expression* of a work, and does not do anything to stop people from appropriating clever *ideas* that happened to be embodied in that work. In contrast, a patent can sometimes be used to stop someone who looks at a copyright work, extracts the clever ideas from it, and creates a new system embodying those clever ideas. It is only a slight oversimplification to say that if there are clever ideas in ones software, and if one wished to protect those clever ideas, one is unlikely to be able to do so through copyright, but may be able to do so through a patent.

A patent is obtained only after preparing a very detailed patent application including discloses, and then only after a patent examiner has reached the view that the patent application is allowable. Many patent applications are filed that never yield an issued patent. The patent application process typically costs at least a few thousand dollars and sometimes could run up to $10,000 or more, including the fees of a patent attorney or agent. In contrast, a copyright is granted upon fixing a work.[101]

Patents are fundamentally *different from copyrights* in many ways. One very practical difference is that it is harder to know when you have created something that is patentable than it is to know when you have created something that is copyrightable.[102] Another practical difference is that it is

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[100] K. F. Crombie, 'The European Commission has suggested that the European Patent Convention should be amended to remove the prohibition against the award of a patent for a program for a computer. In the United States, the Patent and Trademark Office have issued guidelines to examiners, which are seen as liberalizing the availability of patents for software related inventions. Considering the nature of the patent system indicate whether you consider that its wider application to software related inventions is desirable?', 7 May 1999, <www.scottishlaw.org.uk/journal/oct2000/clsoftpat.pdf>, visited 2004.10.25.

[101] 'General information about patents', *Oppedahl & Larson LLP*, 1993, <www.patents.com/patents.htm#compare-copyright>, visited 2004.09.21.

[102] For example, a drawing is copyrightable by the person who created it. It is not evaluated against other drawings to determine whether you have created something unique. A particular circuit, however, is patentable only if it is new and non-obvious when compared

harder (and more costly) to obtain a valid patent than to obtain a valid copyright – especially in the areas relating to computers, software, and the Internet.[103]

It was very difficult to obtain patent protection for software related inventions. Patent applications covering software related inventions were rejected as "unstatutory".[104] Algorithms, which are distinct feature of software, are included on the list of unstatutory inventions. Therefore, in the past, software related inventions were rejected as unstatutory for attempting to patent an algorithm. Due to these difficulties, and the controversy regarding whether software should be capable of patent protection, some companies have relied in the past solely on *copyright protection* and licensing agreements to protect their software.[105]

Development of legislation of patent protection

The history of patents is arguably a long one, although the general availability of a patent in any country and even the possibility of patenting the invention in most countries is a relatively recent phenomenon.[106]

However, it should be mentioned, that the first US patent statute dates back to 1790, having been passed by the first U.S. Congress.[107] Only nine years later, the very *first financial patent* in the US was issued in 1799 for an invention for "detecting counterfeit notes". The automating of financial or management business data in the US did not start to be patented in the 1990s: in 1889 Herman Hollerith obtained a *patent on a method for tabulating and compiling statistical information for businesses.*[108]

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to previously existing circuit, because the inventor usually cannot know about all prior circuit, it is difficult to know whether something is patentable. *See* L. C. Lee and J. S. Davidson (eds.), *Intellectual property for the Internet (*Panel Publishers, 1997) para. 4.15, p. 89.
[103] *Ibid.*
[104] Unstatutory inventions are those, which fall within certain classes for which patent statute prohibits issuance of patents.
[105] 'Software protection, a guide to copyright', *Wells St. John P.S.*, <www.wsrgm.com/software.html>, visited 2004.08.31.
[106] Certain types of government grants of patents on inventions may be traced back into history as the Roman Empire, but it is a stretch to equate there with modern patents and – in any event – there is no unbroken continuity of any such Roman patents protections through to the modern era. Commercial monopolies were granted by early European sovereigns to various private parties with special access to or favor of the monarch. *See* G. G. Letterman, *Basics of intellectual property law* (Transnational Publishers, 2001) p. 169.
[107] Next came the laws of January 17 and May 25, 1791 in France, which adopted the provisions of the English 1623 act. *Ibid.*
[108] This patent and other related patents helped his fledgling "Tabulating Machine Company" to survive and thrive. In 1924 the name of Mr. Hollerith's company was changed to International Business Machine Corporation (IBM). *Hollerith's methods for processing business data, and the related punch cards, were used until the birth of the personal computer. See* R. Stoll, 'Recent development and challenges in the protection of intellectual property rights. New developments in business methods and software patents', May 2001, www.wipo.int/ip-conf-bg/en/documents/pdf/sof01_2_1.pdf, visited 2004.09.16.

International legislation of patent protection

Global recognition of a common body of patent protection was first afforded by the Paris Convention for the Protection of Industrial Property (Paris Convention)[109] in 1883. Since that time, there have been numerous multilateral, regional and bilateral agreements dealing exclusively or partially with patents.[110]

Paris Convention[111] applies to industrial property in the widest sense, including inventions, marks, industrial designs, utility models (a kind of "small patent" provided for by the laws of some countries), trade names (designations under which an industrial or commercial activity is carried on), geographical indications (indications of source and appellations of origin) and the repression of unfair competition.

The basic conditions of patentability, which an application must meet before it is granted, are that the invention must be novel[112], contain an inventive step[113], be capable of industrial application and not be in one of a number of excluded fields. Patents are not available for, amongst other things, discoveries and scientific theories, mathematical methods, computer software producing no technical effect, methods of doing business and aesthetic creations.[114]

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[109] *Main principles*: 1) Nationals of a country belonging to the Convention must enjoy in other countries of the Convention the same rights with regard to intellectual property as their own nationals (article 2(1)); 2) In relation to patents, the filing of a patent application in a Contracting State gives the applicant a right of priority in respect of other applications for the same invention of 12 months in any other Contracting State (article 4). Thus, subsequent filings of patent applications in other Contracting States will not be rendered invalid by any public disclosure of the invention within 12 months "priority" period (article 4(b)); 3) Contracting States have the right to enact measures providing for "compulsory licenses" for abuses of the patent, in particular for failure to work, after expiry of four years from the date of filing patent application or three years from the date of the grant patent, whichever is the later (article 5, 4) the Convention provides for minimum periods of grace for the payment of fees and for domestic legislation to provide for restoration of patents which have lapsed due to non-payment of fees (article 5*bis*). *See* Tritton, *supra* note 57, p. 54.

[110] Some of these agreements have dealt only with particular aspects of patents. A listing of those agreements, which is necessarily not exhaustive, includes the Paris Convention, the Patent Law Treaty, the PCT, the European Patent Convention, the Eurasian Patent Convention, etc. *See* Letterman, *supra* note 106, p. 170.

[111] The total number of contracting states on December 31, 2002, was 164. *See* B. Heinze, 'A Brief Summary of the WIPO Treaties', <www.aplf.org/mailer/issue46.html>, visited 2004.10.27.

[112] This means that the invention must not have been publicly disclosed, anywhere in the world, before the date of filing of the patent application (or before the priority date, if the application has one). *See* 'Glossary of Terms', *The UK Patent office*, <www.patent.gov.uk/patent/glossary/#Novelty>, visited 2004.10.28.

[113] This means that the invention must not be an obvious development of what has gone before, when considered by someone who is skilled in the area of technology to which the invention relates. *Ibid.*

[114] *Ibid.*

When first faced with applications for patents on software-based inventions in the 1950s, the *patent offices routinely rejected the applications on the grounds that software consists of mathematical algorithms* (abstract methods for solving problems not tied to a particular use or tangible structure), which were considered to be unpatentable for the same reason that abstract laws of nature are unpatentable.[115]

A program is by its nature, a human creation, expressed in letters, symbols and numbers, which a machine treats as instructions. Without the program, a machine cannot function in the way that the program would enable it to do. Could it be possible, therefore to patent a program by reference to what it does rather than how it does it? An example of this is the 'Nudge' feature on fruit machines in casinos. The 'nudge' feature was invented in the 1970s and originally consisted of a series of switches to achieve this aim. In the later years of the patent, the process was done by a program on the main computer of the machine, which too remained covered by the original patent. As Aldous LJ in *Fujitsu Ltd*.[116] opined: "Generally speaking, an invention which would be patentable in accordance with conventional patentability criteria should not be excluded from protection by the mere fact that for its implementation modern technical means in the form of a computer program are used."

The application of the above in practice does serve to limit the exclusion of computer programs somewhat. If such were not the case, the patent system would soon become useless as more and more machines and other inventions in everyday life utilize computer software. The approach though does lead to a great deal of confusion in the courts since it is necessary to ask whether an invention is based more on a computer program than on something else. This produces different consequences with each test.[117]

Development of European patent legislation

In Europe work on a Community Patent started in the 1970s, but the resulting Community Patent Convention (CPC) was a failure. The *Luxemburg Conference on the Community Patent* took place indeed in 1975 and the Community Patent Convention was then signed by the 9 member states of the European Economic Community[118] (EEC) at that time.

[115] S. Elias and R. Stim (eds.), Patent, Copyright & Trademark, An Intellectual Property Desk Reference, 7th edition (NOLO, April 2004) pp. 331-332.
[116] In the matter of Application No 9204959.2 by Fujitsu Ltd, 6/3/97 CA. *See* as cited by I. Lloyd, 'Software Patents After Fujitsu. New Directions or (another) Missed Opportunity', *Journal of Information, Law and Technology,* <elj.warwick.ac.uk/jilt/cases/97_2fuji/lloyd.DOC>, visited 2004.11.25.
[117] *Supra* note 100.
[118] The European Community (EC) is the 1st "Pillar" of the European Union, an international organization founded on March 25, 1957 by the signing of the Treaty of Rome. It was originally called the European Economic Community (EEC), but the "Economic" was removed from its name by the Maastricht Treaty in 1992. The Community

However the CPC never entered into force due to the lack of ratification by a sufficient number of countries.

Nevertheless, as a minor consolation, a majority of member states of the EEC at that time introduced some harmonisation into their national patent laws in anticipation of the entry in force of the CPC. A more substantive harmonisation took place at around the same time to take account of the European Patent Convention.[119]

With restatement purpose, before EPC was founded, the national patent law of most of the Contracting States already had provisions *excluding* the patentability of computer programs. Firstly, computer programs were considered to fall under the copyright law and, hence, to be already sufficiently protected. In the early days, this may have been true, because computer programs were usually written in a hardware-oriented language (machine code, assembly language). A variety of higher-level programming languages were not available at the time.

Secondly, computer programs were not widespread and were mainly used for scientific purposes at universities or for purely administrative tasks (like bookkeeping). Hence, there was no demand from industry to provide for patent protection for computer programs for commercial reasons.

A third reason to exclude computer programs from patentability was simply due to the fact that the technical literature of the patent offices at that time hardly included any documentation on computer programs, making a reliable search as to the state of the art in the field of computer programs impossible.

USA: In 1965, IBM Vice President J.W. Birkenstock chaired a U.S. presidential commission that investigated whether software should be patentable. The commission concluded that it should not be patentable, largely because the *patent office was not equipped* to handle the increase in the work that would result if it were patentable.[120]

A landmark decision of the German Federal Court (BGH) of 22 of June 1976 about Dispositionsprogramm: "organisation and calculation programs for computing machines used for disposition tasks, during whose execution a computing machine of known structure is used in the prescribed way, are

is broadly the original institution, and covers a wide range of policy areas where decisions are made collectively by Qualified Majority Voting. Along with the 2nd (Common Foreign and Security Policy) and 3rd (Police and Judicial Co-operation in Criminal Matters) Pillars, where member states maintain a veto over many policy decisions, the Community makes up the European Union. *See* 'European Economic Community', *TheFreeDictionary.com*, <encyclopedia.thefreedictionary.com/European%20Economic%20Community>, visited 2004.10.22.

[119] *Ibid*, 'Community Patent Convention', <encyclopedia.thefreedictionary.com/Community+Patent+Convention>, visited 2004.10.22.

[120] L. C. Lee and J. S. Davidson, *supra* note 102, p. 121.

not patentable" is the first and most often quoted of a series of decisions of the BGH's 10th Civil Senate, which explain why computer-implementable rules of organisation and calculation (programs for computers) are not technical inventions, and elaborates a methodology for analyzing whether a patent application pertains to a technical invention or to a computer program. The Dispositionsprogramm verdict explains that patent law is a variant of copyright for a specialized context, namely that of solving problems by the use of controllable forces of nature.[121]

The European Patent Convention (EPC) came about from a political initiative for centralized system of granting patents in Europe, with all the attendant economies in scale and the avoidance of the duplicated work of several national patent offices. Certain countries, especially France, felt the need for a system which was more complete and rigorous that the Patent Cooperation Treaty (PCT)[122] and thus in 1973 in Munich, the EPC was born and entered into force in 1977.[123]

The EPC provides for a centralized prosecution up to the grant by the European Patent Office (EPO) of patent applications in respect of member States. Once granted, it results in the grant of national patents in those Member States, which were designated by the applicant. The EPO will process the application, conduct a search on the application, publish it, examine it and, if it is found patentable under the EPC, grant national patents for the Designated States. The EPC also provides for third parties to bring opposition proceedings at the EPO to revoke the European patent within nine months from the grant. Thus, the applicant obtains what is often called a *"bundle" of national patents* in the Designated States. Once granted, the issues of validity and infringement post-grant are matters for the national courts, which theoretically will uniformly apply the substantive law of the EPC (as enacted into domestic patent law).[124]

General requirements of EPC

According to Article 52 (1) EPC, a European patent shall be granted for any inventions, which are susceptible of industrial application, which are new and which involve an inventive step. These elements constitute basic requirements for all patent claims.

According to the European Patent Convention, an invention is patentable if:
   1. it is not excluded by Article 52(2) and (3) EPC;

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[121] BGH 1976 Disposition, <swpat.ffii.org/vreji/papri/bgh-dispo76/>, visited 2004.09.15.
[122] The Patent Cooperation Treaty was set up in order to rationalise patent applications for Member States. Its aim is to centralise, simplify and render more economical patent applications for a series of countries. It is a procedural treaty and does not concern itself with the actual grant of patents, which is left to national patent offices. It was signed 1970 and came into force 1978. All European countries have ratified the convention.
[123] Tritton, *supra* note 57, p. 78.
[124] *Ibid.*, p. 79.

2. it is novel (Article 54 EPC); involves an inventive step, i.e. is not obvious (Article 56 EPC); is capable of industrial application (Article 57 EPC).

Exclusions

The European Patent Convention governs the patentability of an invention as a European Patent. The patentable subject matter is stated in article 52(1). According to this article *"European patents shall be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step"*. The Convention does not define the significance of "invention", but within the meaning of Art. 52(1) an invention must be of both a concrete and technical character.[125]

It does, though, include a list of subject matter and activities, which are deemed *not* to be inventions. According to Article 52(2) EPC, discoveries, scientific theories and *mathematical methods*; aesthetic creations; schemes, rules and *methods for* performing mental acts, playing games or *doing business, programs for computers* and presentations of information shall *not* be regarded as inventions.[126]

However, Article 52(3) EPC stipulates that this provision shall exclude patentability of the subject matter or activities referred to *only to the extent* to which a European patent application relates to such subject matter or activities *as such*.[127]

Thus, it follows that, although methods for doing business, programs for computers, etc., are *as such* explicitly excluded from patentability, a product or a method which is of a technical character may be patentable, even if the claimed subject-matter defines or at least involves a business method, a computer program, etc.

Further, in accordance with Rules[128] 27 and 29 EPC, in order to be patentable, an invention must be of a *technical character* to the extent that it must relate to a *technical field*, must be concerned with a *technical problem* and must have *technical features* in terms of which the matter for which protection is sought can be defined in the patent claim.[129]

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[125] Guidelines for Examination in the European Patent Office, C-IV, 2.3.6, www.european-patent-office.org/legal/gui_lines/e/index.htm, visited 2004.10.04.

[126] H. Hartzell, 'Patentability of Business Methods', <www.juridicum.su.se/jurweb/utbildning/master/master_of_european_intellectual_property_law/2004%20Seminar%20Patent%20Law/Hartzell_1(2).doc>, visited 2004.10.16.

[127] The USA explicitly rejected this exclusion from patentability in the now famous *State Street Bank* decision in 1998.

[128] Implementing Regulations to the Convention on the grant of European patents of 5 October 1973 (as last amended by Decision of the Administrative Council of the European Patent Organisation of 13 December 2001).

[129] Tritton, *supra* note 57, p. 104.

USA: The basic requirements for patentability of an invention is set out in the US Patent Act 5 U.S.C section 101; *"A new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof"* can be patented. Unlike the EU, the US does not require a patentable invention to have a "technical character." Since the legislation, due to its general requirements, allows a wide interpretation. The American case law has developed various doctrines to limit what is patentable subject matter. As non-patentable items can be mentioned; laws of nature, physical phenomena or abstract ideas, and perpetual motion machines.[130] Mathematical formulas are not patentable subject matter to the extent that they are merely abstract ideas. But data transformed by a machine through a series of mathematical calculations to produce "useful concrete and tangible results" is patentable.

Business methods used to be considered as products of the nature or abstract ideas, and therefore non-patentable. The first case which stated that a business method could be patentable was *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*[131] In this case a patent had been granted for a method managing an investment portfolio, the method involved claims to a data processing system for implementing an investment scheme for use in business. The patent was questioned on the grounds that it was improperly directed to a business method, and therefore invalid for failure to claim statutory subject matter under section 101.[132]

The Court stated that *by producing a useful, concrete and tangible result, the method constituted a practical application of a mathematical algorithm, rather than an abstract idea.* It involved statutory patentable subject matter, and the business method was subject to same legal requirements for patentability as other process or method. It was hereby declared that patent protection is available for software-related inventions that implement methods of doing business. In the decision *AT&T Corp. v. Excel Communications* the Court further developed the principles, and established that business methods and software constitute patentable subject matter that are subject to the same requirements that must be satisfied by any patent application.[133] The Courts decisions have led to a flood of respective business method patents.[134]

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[130] *Diamond v. Chakrabarty*, 447 U.S. 303. 1980.
[131] 149 F 3d 1368, 47 USPQ 2d 1596, CAFC 1998.
[132] *Supra* note 126.
[133] 172 F. 3d. 1352, 50 USPQ 2d 1447, 1453-54 CAFC 1999.
[134] *State Street Bank* decision in 1998, combined with the large amount of new business opportunities that arose with the growing popularity of the Internet, led to a great increase in patent applications relating to such inventions, in the USA as well as in Europe. The European Patent Office (EPO) reported in late 2000 that it has about 2,000 pending "business method" applications, which is about twice as much as two years ago. In contrast, the United States Patents and Trademark Office (USPTO) had over 8,000 pending business method applications in 2000 alone. A study (available at http://www.olswang.com/patents/ access date 2004.10.04) published October 2000 by Olswang and Oxford University found that 52 percent of the 300 analyzed business related European patent applications were filed by U.S. companies, compared with less than 20 percent for companies from the U.K., Germany and France. In comparison, U.S. companies accounted for 28 percent of all EPO applications.

Computer programs are only patentable in connection with *a technical effect, which in itself must have inventive step* (T38/86[135]).[136]

Technical character of invention. Exclusion 'as such'

Computer programs are a special case. When loaded in a computer, a program causes the computer to exhibit certain behaviour, which can be argued to constitute a technical effect, since a computer is a physical and technical apparatus. It then may follow that any computer program has a technical character. However, this would render their exclusion under Articles 52(2) and (3) EPC meaningless.

Though, the exclusion only relates to the computer program and not to an apparatus using a computer program and causing a technical effect (T 26/86) (*Koch & Sterzel*).[137] It therefore does not exclude the patenting of all computer-related inventions.

Moreover, the Board of Appeal of the EPO (T 1173/97)[138], made the following consideration:

> The wording "computer programs as such" in Article 52 (2c), (3) EPC does not cover all computer programs but necessarily only some of them. After all, if this were not the case, there would have been no reason to add the words "as such".

The Board considered that the normal physical effects (i.e. current flowing in a computer when the program is run) are not sufficient to lend a computer program a technical character, since otherwise, this would then be true for all computer programs.

As confirmed by numerous decisions of the Board of Appeal of the EPO, in order for the claimed subject matter to qualify as "invention" within the meaning of Article 52(1) EPC, the claimed subject matter must be of a technical character, mainly based on the reasoning that the activities listed in Article 52(2) have in common that they imply something non-technical and that, therefore, an invention that is technical is patentable.[139]

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[135] In that case, the EPO Board of Appeal, having found that detecting and replacing linguistic expressions on the basis of understandability was a mental act, went on to say that the exclusion of mental acts as such from patentability was tempered by "the intention of the EPC to permit patenting in those cases in which an invention involves some contribution to the art in a field not excluded from patentability". *See* G. M. Rogers, 'Patent act 1977, In the matter of Patent Application Number GB9719454.2 in the name of International Business Machines Corporation, Decision of the Patent Office', 7 September 2001, para. 2, www.patent.gov.uk/patent/legal/decisions/2001/o39001.pdf, visited 2004.10.16.

[136] D. Visser (ed.), *The annotated European Patent Convention*, 11th ed. (H. Tel, Publisher Veldhoven, 31 December 2003) p. 44.

[137] Supplement A.

[138] *Ibid.*

[139] In drafting the EPC, it was considered self-evident that an invention must constitute "technical progress" to be patentable, and so it was unnecessary to include a statement to

The items on the list of Article 52 (2), (3) EPC are all considered either purely abstract in nature (e.g. discoveries, scientific theories, etc.) or purely non-technical (e.g. aesthetic creations or presentations of information) and, consequently, lack any technical character. Hence, if on the one hand the claimed subject matter is one of the items listed in Article 52 (2) EPC but, on the other hand, for some reasons, is nevertheless of a technical character, it is not an item as such within them meaning of Article 52 (3) EPC and therefore is not to be excluded from patentability under Article 52 (2), (3) EPC. Generally speaking, the exclusions referred to in article 52 (2) of the EPC are interpreted narrowly by the Boards of Appeal.

How can one determine whether an invention has a technical character? According to the case law, a technical character may, for example, be present due to the fact that:

- a *technical effect* is achieved by the claimed subject-matter;
- *technical considerations* are required to carry out the claimed subject-matter;
- a *technical problem* is solved by the claimed subject matter; or
- the claimed subject-matter is explicitly or at least implicitly defined by concrete, *technical means*.

Technical effect

In a decision of a Board of Appeal of the EPO (T 1173/97)[140] (*IBM*), the Board noted that a computer program is considered to have a technical character, if it causes, when run on a computer, a technical effect which may be known in the art but which goes beyond the "normal" physical interactions between program and computer (between software and hardware). Such effect may, for example, be found in the control of an industrial process or in the internal functioning of the computer itself. It may for instance *lie in the fact that it solves a technical problem.*

After further considerations, the Board defined the following criteria for the patentability of a computer program:

> A computer program may be claimed either by itself, as a record on a carrier or as a data signal in application for a patent (T 1173/97, T 1194/97[141] and T 163/85[142]). The claim should define at least those features or steps by which the further technical effect is achieved when the program is run on a computer.

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this effect in Article 52. *See* A. Engelfriet, 'The patentability of business methods at the European Patent Office', *Ius mentis*, www.iusmentis.com/patents/businessmethods/epc/, visited 2004.09.21.

[140] Supplement A.

[141] *Ibid.*

[142] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t850163ex1.htm>, visited 2004.10.25.

For further examples, in T 26/86[143], it was held that the combination of an X-ray tube controlled by a computer program loaded in a general-purpose computer produced a technical effect (optimum exposure, overload protection).

In T 158/88[144] (*Siemens*), the Board decided that a claim directed to a method for the display of Arabic characters in a particular shape did not describe a technical method. In general, where data to be processed did not represent operating parameters or a device or did not have physical effect on the way the device worked, the method was excluded from patentability. The statement in the claim that technical means (in this case a visual display unit) is to be used to carry out a process is alone sufficient to render the process patentable within the meaning of Article 52 (1) EPC.[145]

Moreover, already back in 1986 (T 208/84[146]; *Vicom*), the Board of Appeal decided that a claim directed to a technical process carried out under the control of a computer program, could not be regarded as relating to a computer program as such. The claim defined a method of digital processing of images, e.g. photographs taken by satellites. For the same reason, a claim directed to a computer which was set up to operate in accordance with a specified program for controlling or carrying out a *technical process* could not be regarded as relating to a computer program as such. In other words, it was held that a data processing method carried out on a physical entity, in the particular case images stored as electrical signals, is a technical process.

It is important to note that the patentability of the subject matter of a claim is not to be ruled out simply because the claim defines a mixture of both technical and non-technical features (T 26/86); the fact that a claim includes non-technical features does not detract from the technical character of the overall teaching. In other words, a claim must be assessed as a whole.

The technical character of an invention cannot be affected by the presence of an additional feature, which as such would itself be excluded from patentability under Article 52(2) and (3) EPC. So, a mix of (known) technical features and apparently non-technical features may still be patentable as long as the latter features contribute to an overall technical effect.

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[143] Supplement A.
[144] *Ibid.*
[145] In T52/85 [1989] 8 EPOR 454 (*IBM* v. *Semantics case*) IBM sought to patent a system for automatically generating a list of expressions semantically related to an input linguistic expression and a method for displaying such a list of expressions. In this case the board gave the view that 'semantic relationship' was semantically related linguistic expressions had to do with the linguistic significance of words and was thus a linguistic problem and not a technical problem. Board regarded what's claimed as a straightforward automation of a linguistic problem producing no technical effect. In this case the application for patent was also rejected.
[146] Supplement A.

Actual cases in which a "technical contribution" has been found include:

- an invention in which an X-ray apparatus was controlled by a data processing unit in a way which provided an optimum balance between potentially conflicting operational requirements;
- an invention in which an increase in processing speed in a computer was achieved by a new and non-obvious method;
- an invention concerned with communication between independent systems which involved a stage of activities requiring the use of technical skills (beyond those expected of a computer programmer) to be carried out before actual programming could start.

On the other hand, any invention that was concerned solely with the nature of data or the way in which a particular application operated on data would not make a technical contribution and so could not be protected by a patent. The mere computerisation of a method or technique that was already known, or the computer implementation of a business or similar method (such as a new mathematical model for tracking movements of the stock market) would not qualify as patentable inventions either.[147]

Summarizing the above, *if a computer program has the potential to bring about, when running the computer, a further technical effect which goes beyond the normal physical interactions between the program and the computer, it is considered as an invention within the meaning of Article 52 (1) and a patent may be granted*, provided the other requirements of the EPC are met, i.a. the requirements of novelty and inventive step of the claimed subject-matter.[148]

Technical consideration & technical problem involved

An invention has a technical character if there are technical considerations involved.[149] The contribution approach (i.e., is the contribution made by the invention technical) is to be used only for assessing inventive step.[150] Technical considerations may lie either in the underlying problem solved by the claimed invention, in the means constituting the *solution of the underlying problem*, or in the (technical) effects achieved in the solution of the underlying problem. The very need for such technical considerations

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[147] 'Patents: Commission proposes rules for inventions using software', *European communities*, 20 February 2002, <europa.eu.int/comm/internal_market/en/indprop/comp/02-277.htm>, visited 2004.11.20.

[148] How much does it differ from "producing tangible and useful result" under US law?

[149] In T 769/92 (S*ohei*), the teaching according to the system and method claims to provide in the memory unit of a computer system five files intended for different purposes and to cause the processing unit to perform five functions was deemed to require technical considerations, thereby implying a technical character. *See also* Supplement A.

[150] In T 931/95 (*Pension Benefit System*), the Board explicitly stated that having technical character is an implicit requirement of the EPC to be met by an invention in order to be an invention within the meaning of the Article 52 (1) EPC. *See also* Supplement A.

implies the occurrence of a (at least implicit) *technical problem to be solved* and (at least implicit) technical features solving that technical problem.

The use of technical means

In determining whether claimed subject matter is excluded, it is to be noted that the exclusion of Articles 52(2) and (3) only applies to method claims and not to apparatus claims. An apparatus constitutes a physical entity or concrete product, and thus is an invention within the meaning of Article 52(1) EPC, even if the apparatus is adapted for performing or supporting an economic activity (T 931/95[151]).

The use of technical means for carrying out a method for performing mental acts, partly or entirely without human intervention, may render such a method a technical process or method (T 38/86[152]). However, a feature of a method, which concerns the use of technical means for a purely non-technical purpose and/or for processing purely non-technical information, does not necessarily confer a technical character to such a method (T 931/95[153]).

In other words, a method claim that does not mention any implementing technology will be rejected under Articles 52(2) and (3) directly, since *no implementation necessarily means **no** technical character*. If implementing technology is mentioned, but the implementing technology is used for purely non-technical purposes and/or for processing purely non-technical information, the method claim will be rejected (T 931/95[154]).

It is noted that, for methods and apparatuses, if their technical character is based on a technical effect, the corresponding claims should include the technical features, which cause this effect. In case of a computer program, however, it is sufficient that the subject matter (the program) has the potential to cause the (further) technical effect. This is clearly due to the fact that a computer program cannot operate without the computer. Nevertheless, one should bear in mind that the computer program *claim should define at least all those features or steps by which the further technical effect is achieved, if the program is run on the computer.*

Furthermore, it is noted that claims directed to computer programs are always regarded as product claims. This is important in relation to the rights conferred by a European patent.

Other requirements

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[151] Supplement A.
[152] *Supra* note 142, <legal.european-patent-office.org/dg3/biblio/t860038ep1.htm>, visited 2004.10.25.
[153] *Supra* note 150.
[154] *Ibid.*

It should also be borne in mind that the test for determining whether there is an invention within the meaning of Article 52 (1) EPC is separate and distinct from the question whether the subject matter is susceptible of individual application, is *new* and *involves an inventive step*. For example, an administrative method of stock control, wherein use is made of a computer, may be held a lack a technical character and therefore not be patentable, although it may be applied to the store of spare parts of factory and, hence, be industrially applicable. Similarly, a bookkeeping method solely defined by the use of a computer for carrying out the book keeping may be new over the same bookkeeping method carried out manually, but is may still be excluded from patentability due to lack of technical character.

Despite the fact that software-based inventions may qualify for a patent, most do not because they are considered *obvious over the prior art*, and must therefore be protected in another manner – usually under trade secret or copyright laws.[155] Virtually all patents that have been obtained on software-based inventions are utility patents, although design patents have been issued on computer screen icons.

Assessing novelty

The EPO Guidelines for examining computer related inventions have recently been revised for the first time in many years. The newly revised Guidelines call for there to be a "further technical effect" which must be more than merely causing the computer to operate, i.e. an effect that goes beyond the normal interactions between the program and the computer. The Guidelines say that inventions may be patentable under Article 52 even if the further technical effect is known in the prior art. Technical character may be indicated by whether "technical considerations" are taken into account in making the invention, as in Board of Appeal Decision T 769/92 *Sohei*.[156]

This appears to open the door to claims for inventions, which derive their novelty from subject matter, which is excluded *per se* (e.g. presentations of information or methods of doing business). However, in many cases this will be illusory; the change brought about by other recent decisions of the EPO Technical Boards of Appeal merely shifts the focus from patentability (Article 52) to inventive step (Article 56). For example, Board of Appeal Decision T 931/95[157] *Pension Benefits Systems* Partnership holds that for a method claim, the inclusion of technical means (e.g. a computer) for a purely non-technical purpose, or processing purely non-technical data, does not confer technical character, whereas a computer system programmed for use in a non-technical field (e.g. business and economy) has the character of

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[155] S. Elias and R. Stim, s*upra* note 115, pp. 331-332.
[156] Supplement A.. *See also* 'Computer-Related Inventions - New EU Draft Directive and New EPO Guidelines', *R.G.C.Jenkins & Co.*, <www.jenkins-ip.com/news/pd_10.htm>, visited 2004.10.25.
[157] Supplement A.

a concrete apparatus and is an invention within Article 52. This appears on its face to permit methods of doing business so long as they can be dressed up in a conventional computer or computer network, as in the *US State Street Bank* v. *Signature*. However, on a full reading it merely takes the examination past the blockade of Article 52 and requires that the examiner proceed to consider inventive step, by the usual process of identifying the closest prior art and the technical problem it presents.[158]

If, according to the new Guidelines, a technical problem with the prior art, solved by the invention, can be identified, then the solution to that problem is the invention's "technical contribution". The presence of a technical contribution establishes that the claimed subject matter has a technical character and is patentable subject matter within the terms of Article 52. If the problem solved over the prior art is not a technical problem, the claim will be rejected for lack of inventive step - even if the new matter defining the difference from the prior art (for example, an inventive new pension scheme as in Decision T 931/95 Pension Benefits Systems Partnership) is non-obvious.

Thus it remains the case that an improvement over the prior art that lies exclusively in subject matter which is excluded under Article 52(2) (typically, business methods) cannot contribute to inventive step.

While the new Guidelines (and *proposed Directive*) appear to set out a round-about route to reach a conclusion reached as long ago as 1986 under *Vicom Systems Inc.'s* Application[159], this approach should have the effect of requiring that examiners identify the differences between the invention and the prior art (by conducting a search if necessary). This in turn is intended to avoid injustices that are perceived to have occurred in cases such as *Raytheon Co's Application*[160], in which the applicant was denied a proper examination of the invention against the state of the art, and the patent application was rejected outright as relating to a mere mental act

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[158] 'Computer-Related Inventions - New EU Draft Directive and New EPO Guidelines', *R.G.C.Jenkins & Co.,* <www.jenkins-ip.com/news/pd_10.htm>, visited 2004.10.25.

[159] Supplement A.

[160] 1993 RPC 427. In this case the company sought to patent an application, which was able to identify a type of ship from a distance by comparing it with a database of images of ships, which it checked to find a match. In essence, this was a way of performing a mental act. Mr J Jeffs QC commented that: "What is being done is to carry out a comparison such as is done in the mind in recognising an object but doing it by electronic means." However, it was suggested in the case that a human mental act, by the use of the word 'act' must entail a conscious and not subconscious process. The practice of recognition of objects and smells through the use of our senses is a subconscious effort. However, if an alternative method (for instance, the recognition of a smell by the use of chemical analysis) of recognition was used, this would constitute a technical advance and be patentable. The position remains unclear and greatly confusing. It may though be possible to obtain a European Patent where the technical manner of conducting the process was an advance in the state of the art. *See* as cited by Crombie, *supra* note 100.

(recognition of silhouettes of a ship), which *per se* is excluded subject matter.[161]

At present the EPO is refusing to search some inventions they perceive as being non-technical, but this practice should change if the new Guidelines are followed or if legislation envisaged by the proposed Directive is adopted.[162] Currently, claims of European patent applications, which relate to business methods or merely specify commonplace features relating to the technological implementation of such methods, are not "to be searched if the search examiner *cannot establish any technical problem* which might potentially have required an inventive step for it to be overcome. In other words, in such cases it is not possible to carry out a meaningful search into the state of the art".[163]

On the other hand, during examination of a European patent application, the examiner is encouraged to skip the determination of technical considerations and to go directly to the assessment of novelty and inventive step. If novelty-destroying prior art comes up, the determination may suddenly become important, since a non-technical feature cannot serve to make the invention novel over the prior art (T 619/98).

Nevertheless, a novel computer program loaded into a known computer makes the combination novel regardless of any technical considerations the program may or may not have (T 208/84[164], T 1173/97[165]). This appears to be in conflict with T 619/98.

Determining inventive step

An invention must make a technical contribution through the features that are novel compared to the closest prior art. In identifying this technical contribution, the problem-solution is normally used.

The problem itself does not have to be technical, but if it is not, then the solution must be. In T 1002/92[166] a non-technical problem (how to

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[161] *Supra* note 158.

[162] *Ibid.*

[163] Only partial search report might be established pursuant to Rule 45 EPC. *See* 'Notice from EPO dated 26 March 2002 concerning business methods', *European Patent Office,* 26 March 2002, <european-patent-office.org/news/info/2002_03_25_e.htm>, visited 2004.10.21.

Regarding search, the EPO examiner has the discretion to do a complete search, a partial search or even no search at all, depending on the extent to which the claims refer to technical subject matter. In the last two cases, the EPO transmits a declaration under Rule 45 EPC (EPO Form 1507) stating that it was not possible to carry out a meaningful search into the state of the art. *See* L. Manke, 'Protecting computer-related and business model inventions', *Managing Intellectual Property*, May 2003, <www.legalmediagroup.com/mip/?Page=3&SID=1951>, visited 2004.11.25.

[164] Supplement A.

[165] *Ibid.*

[166] *Ibid.*

efficiently serve a queue of waiting customers) was solved in a technical way (a system that determines who to serve at which counter). Since the solution was not obvious, the invention was patentable.

The technical problem has to be formulated in such a way that there is no possibility of an inventive step being involved by purely non-technical features. Such a formulation of the problem could refer to the non-technical aspect of the invention as a given framework within which the technical problem is posed, or as an incentive for setting out to provide the technical part of the claim (T 1053/98[167]).

Therefore the assessment of inventive step is carried out from the point of view of a software developer or application programmer, as the appropriate person skilled in the art, having the knowledge of the concept and structure of the business method what sets out to implement the business method. A claim element like "means for performing a business step" can be implemented without inventive activity, regardless of the business step.

What this means is that if a method claim is rejected due to lack of technical considerations, a corresponding apparatus claim in a straightforward means plus function format will be rejected for lack of inventive step.

A business feature that is inseparably linked with one or more technical features in a claim should be considered as necessary for achieving a technical result, and so is regarded as a technical feature. The feature is then construed as limited exclusively to a feature realized by hardware or software (T 1002/92[168]).

Conclusions

The major difference between the US and the EU approach is that the scope of patentability is much more narrow in the EU. One of the reasons is the criterion of industrial application in the European patent system; it is more focused on the requirement of technical character. European patent applications concerning methods for doing business need to be combined with something, which produces, or in combination with the method produces, a technical effect.[169] The EU system is based on what *does not* constitute an invention, while the US system is based on what *does* constitute an invention. Since the US Patent Act does not include any explicit areas excluded from patentability, and methods can be patented as such, it opens up the system for a very wide view on what is patentable or not. As indicated above, the current case law of the European Boards of Appeal does not provide patent protection to the same extent, as it is

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[167] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t981053eu1.htm>, visited 2004.10.25. *See also* Supplement A.
[168] Supplement A.
[169] Tritton, *supra* note 57.

possible in the United States.[170] However, under current European legislation methods for doing business and computer programs are not always excluded from patentability,[171] and sometimes there are controversial decisions granted by the ==same institution.[172]==

A lot of the confusion would be avoided if only there were a clear definition of what constitutes a technical invention. Such a definition is unlikely to arise. However, some categories of technical activities were arrived on the bases of EPO decisions:

- *processing physical data is technical.* Physical data may be, for example, data representing an image (T 208/84[173]) or data representing parameters and control values of an industrial process (T 26/86[174]). However, monetary values (T 953/94[175]), business data (T 790/92) and text (T 38/86) are not physical data.
- p*rocessing which effects the way in which a computer operates is technical.* For example, saving memory, increasing speed, improving security, operating a user interface (T 236/91, T 59/93), configuring the operating system (T 265/92), coordinating and controlling internal data (T 6/83[176]), or assisting in solving diagnostic problems in data communication (T 216/89). For instance, using computers instead of humans to process secret/private/sensitive data would increase security or confidentiality.
- *processing which is based on considerations of how a computer works is technical* (T 769/92[177]). Automating a known process may be technical for example if the automated process provides surprising speed or economy of scale benefits.[178]

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[170] *Supra* note 126.
[171] 'Patentability of methods of doing business', EPO press releases, 2000, <www.european-patent-office.org/news/pressrel/2000_08_18_e.htm>, visited 2004.11.25.
[172] Amazon's infamous "gift-ordering" patent (EP 927945) is just one example of a patent for such a "business tool". Other patents granted for business methods include for example EP 807891 "shopping cart" as used on e-commerce web sites, EP 803105 for sales over a network, or EP 726304 for making online offers for electronic bids (and many many more...)
But in most cases this is due to the *form* of the application, rather than its *substance*. The difficulty can very often be overcome by a simple re-writing of the claims, so that rather than claiming a *"business system"* involving certain "mental acts" by the operator, instead the patent re-written to present the very same software software as a *"business tool"*, *allowing* (but not *prescribing*) the user to take some action. *See* 'What is "technical"?', *Foundation for a Free Information Infrastructure UK,* October 2003,<www.ffii.org.uk/swpat/eudir/issues/technical.html>, visited 2004.11.16.
[173] Supplement A.
[174] *Ibid.*
[175] *Ibid.*
[176] EPO boards of appeal decisions, <www.legal.european-patent-office.org/dg3/biblio/t830006ex1.htm>, visited 2004.10.25.
[177] Supplement A.
[178] J. Heald, 'Further technical effect', 16 May 2003, <www.aful.org/wws/arc/patents/2003-05/msg00115.html>, visited 2004.11.15.

4 Prehistory of draft Directive

When it comes to the patentability of computer-implemented inventions, Europe and the United States have differing and diverse opinions. The United States has a liberal approach to the patentability of computer software and therefore grants patents for such inventions. This is not the case in Europe, where computer programs are patentable only if they make a "technical contribution" to the state of the art, as was discussed above. However, divergent positions are being adopted on this issue by various European Member States as a result of case law and administrative practice.[179]

Green paper

The main interest for the special treatment of software protection represents changes, which were politically reaffirmed in the Green Paper on the Patent System in Europe, which were mainly devoted to introduction of unitary Community Patent, covering the entire territory of the European Union. Although a clarification of the protection of computer programs was there only a marginal issue. The paper (and those who were consulted) was very much in favour of patenting of software. The strongest argument used was that since this was possible in the USA this change had a very positive impact on the development of the software industry. EUROLINUX petition to the European Parliament resulted in public debates in some member countries.

The Green Paper was announced by the Commission in the first action plan for innovation in Europe in *November 1996* and in the action plan for the single market; its purpose was to launch a wide-ranging consultation of interested parties, such as small and medium-sized enterprises (SMEs), individual inventors, patent agents and others on the one level, and Member States and other Community institutions on the other, to determine the real needs as regards the protection of innovation and to examine whether new Community measures were necessary to improve and modernise the present system of patents in Europe.[180]

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[179] 'Directive on Patentability of Computer Programs', *A&L Goodbody*, 1 June 2004, <www.techlaw.ie/news/load.asp?file=PUB:1029>, visited 2004.10.22.
[180] Among other questions, the Green Paper asks whether the Community Patent Convention, which was concluded in Luxembourg in 1975 and has still not entered into force, should be amended and converted into a Community legal instrument, which would ensure that businesses and innovators could secure patent protection throughout the single market on the basis of a single patent application. The Commission also examines whether further harmonisation might be needed at Community level of certain aspects of patent law, such as the impact of the information society and electronic commerce on software-related inventions, employees' inventions, the use of patent agents and the recognition of professional qualifications. Lastly, the Green Paper asks how the system of fees and charges for patents can be adapted in a way, which corresponds to the service performed

On *5 February 1999* the Commission adopted a communication to the Council, the European Parliament and the Economic and Social Committee on Promoting innovation through patents, which was a follow-up to the Green Paper on the Community patent and the patent system in Europe.[181]

The communication stressed the essential role of patents in stimulating investment in the research and technology sector. The Commission considered that a system of individual protection for each patent would have provided: equal access to new technologies for all users and consumers in the European Union; and more transparency in the competition conditions for innovative businesses.

The Community activity should therefore concentrate on creating an individual patent to apply to the whole of the Community. The communication also announced new legislative initiatives covering:
- the patentability of computer programs;
- the role of patent agents and the recognition of their professional qualifications.[182]

Consultations

On *19 October 2000*, the European Commission, Directorate General (DG) Internal Market, launched a consultation on the subject, "The Patentability of computer-implemented inventions". The aim of the consultation was to seek the views of interested parties, the public at large and Member States in order to help the European Commission formulate a policy that strikes the right balance between promoting innovation through the possibility of obtaining patents for computer implemented inventions and ensuring adequate competition in the market place. Comments were invited by *15 December 2000* on the preferred scope and economic impact of harmonization in the area of computer implemented inventions.[183]

According to the Final Report by PbT Consultants, who were preparing the Results of the European Commission consultation exercise on the patentability of computer implemented inventions, main concerns of those

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and does not form an obstacle to the protection of innovation. *See* 'Intellectual property', Bulletin of the European Commission, 16 September 1997, para. 1.3.65. <europa.eu.int/abc/doc/off/bull/en/9706/p103065.htm>, visited 2004.10.22.

[181] European Communities Communications, <europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_d oc=COMfinal&an_doc=1999&nu_doc=42>, visited 2004.10.22.

[182] 'Green Paper on the Community patent and the patent system in Europe', Summaries of legislation of EU, *European Communities*, <europa.eu.int/scadplus/leg/en/lvb/l26051.htm>, visited 2004.10.22.

[183] The paper contained a number of proposed "Key Elements" for a harmonized approach to the patentability of computer-implemented inventions in the European Community. The result of the European Commission consultation exercise on the patentability of computer implemented inventions.

worried by software patents, such as Linux[184], were, in order of frequency of mention: 1) patents favor large organizations, 2) patents are anti open source; 3) philosophical objections; 4) software is different; 5) high risk of inadvertent infringement; 6) copyright is adequate protection; 7) patents are unnecessary; 8) low quality of software patents; 9) increased product cost, 10) abuse of patents; 11) threat to interoperability & standards.

The Consensus Position of Supporters of software related patents stated: 1) strong support for the TRIPS agreement on a global scale; 2) detail should be handled by jurisprudence rather than direction by, for example, a European Directive; 3) traditional patentability criteria should apply to software in the same way as other technologies. In particular there was a majority view that each of the criteria, in turn, should be tested against the characteristics of the invention as a whole; 4) the most likely criterion for rejection of a software patent application is lack of "technical effect and/or technical character". Failure of the tests for "industrial applicability" or "non-obviousness" may contribute; 5) practical guidance on software patentability is required including examples of what is, and is not, patentable; 6) copyright and patent protection should be independent forms of protection with the possibility of "double-banking"; 7) patentability criteria should be strictly and consistently applied in order to limit the number of successful applications for inventions involving business methods; 8) patents are applicable to any form in which software is sold including downloads and all forms of data carrier; 9) no changes in general patent law are required; 10) a "one-stop" European patent application is required; 11) remove the "software as such" references in Article 52 of the European Patent Convention.

There were differences in view as to how urgent it is for the Commission to take action regarding harmonization. It was agreed that the principal harmonization requirement is to achieve common criteria for rejection/acceptance of patent applications, *particularly those involving business methods*. Some believed that a Directive was urgently required; others believed that cooperation between patent offices would achieve the same effect. Some believed that harmonization was required on a global scale.

Other interesting proposals included: 1) short protection time; 2) use of compulsory licences; 3) limited liability for open source distributors; 4) *sui*

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[184] A total of 1447 responses were received, amounting to around 2500 pages of text. The largest single element in the response was a "petition" organized by the Eurolinux Alliance who had requested responses to be sent to themselves for forwarding to the Commission. Almost 1200 such responses were forwarded along with the response from the Alliance itself. Eurolinux is an alliance of over 200 commercial software publishers and European non-profit associations with the goal to promote and protect the use of Open Standards, Open Competition and Open Source Software such as Linux.
Responses were also received from individuals and organizations in all EU and EEA member states apart from Liechtenstein, various CEEC countries, the US, Australia and South Africa.

generis protection for software i.e. a special form of protection that would replace both copyright and patent protection.[185]

Proposed for Directive

Two factors have resulted in a certain ambiguity and lack of transparency in the patenting of computer-implemented inventions (CIIs) in the European Union. While Article 52(2)(c) of the EPC excludes "computer programs as such" from patentable subject matter, the EPO has in practice granted many patents on computer implemented inventions, by narrowly interpreting this exclusion.[186]

The secondly, the basic national laws on patentability are in principle uniform as between themselves and the provisions of the European Patent Convention, but their detailed interpretation - with regard to the effect of a European Patent as well as a national patent - is the preserve of the courts. While the national courts may accord persuasive authority to decisions of the EPO's appellate bodies (and to decisions of other Member States' courts), they are not bound to follow them, and in the event of direct conflict, they may have no choice but to respect binding precedents in accordance with their own legal traditions.[187] Thus, as national courts of EC member states are not bound to follow the decision of EPO appellate bodies, this has led in practice to divergences in the interpretation of the EPC and consequently in the scope of protection accorded in different EU member states to certain classes of invention, including CIIs.[188]

Given that differences in treating protection for software among Member States create barriers to trade and impede the functioning of the Internal Market, the European Commission proposed a Directive[189] in 2002 to harmonise legal rules governing the patentability of computer-implemented inventions under different national laws which due to some observers can have a negative impact on investment and free movement of goods within

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[185] It should also be recalled that patents *can be obtained by a purely national route without the involvement of the European Patent Office*. The above arguments concerning divergences between national laws apply equally in such situations, but there is the additional factor that the applications will be fully processed and granted exclusively according to national laws. Thus even the unifying factor of the EPO as a single granting authority will be absent, with the consequence that members of the same patent "family" in different countries (i.e. patents all relating to the same invention and stemming from a single original application) could be granted from the very outset with very different scopes of protection. *See* 'PbT Consultants 2001: Summary Report on EU Software Patentability Consultation', <swpat.ffii.org/papers/eukonsult00/softanalyse/index.en.html>, visited 2004.10.28.

[186] *Supra* note 11.

[187] *Supra* note 18.

[188] 'Comments on the draft EC Directive on the Patentability of Computer Related Inventions', *International Chamber of Commerce*, 12 September 2002, <www.iccwbo.org/home/statements_rules/statements/2002/ec_directive_patentability.asp>, visited 2004.10.22.

[189] Proposal 2002/0047 of 20 February 2002.

the EU.[190] When the European Parliament considered the Directive in *September 2003*, a number of amendments to the proposal were adopted.

In *May 2004, (17-18)* the European Council of Ministers reached a political agreement[191] and approved a compromise proposal put forward by the Irish Presidency.[192]

Main purpose

Under the terms of the common position, the proposal contains provisions that a computer program as such cannot constitute a patentable invention.[193] For a computer-implemented invention to be patentable it must be susceptible of industrial application and involve an inventive step.[194]

The Explanatory Memorandum[195] to the Commission's proposal for a Directive on the patentability of computer-implemented inventions refers to several studies, including two conducted on behalf of the Commission itself, which were taken into consideration in the formulation of the proposal. The model taken for comparison purposes tends to be the United States, because it has the most open approach to patenting of computer programs. In contrast, the present practice in Europe is not to permit patenting of computer programs 'as such', and only to grant patents for inventions, which use computer programs in their implementation if an inventive 'technical contribution' is present. The situation in Japan is normally considered to be the intermediate between the American and European positions.

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[190] If executed, this Directive will require EU nation states to bring their national laws into line on the subject, which will in turn necessitate amendment of the European Patent Convention. *Supra* note 158.

[191] On the same meeting the Council did not reach agreement by unanimity, as required, on the Presidency's compromise proposal for a Council Regulation on the Community patent. Noting that all conceivable compromise solutions for the only outstanding issue, which concerns the translation of patent claims, had been tried, the Presidency stated its intention to refer this matter to the President of the European Council. *See* 'Press Release of the 2583rd Council Meeting, Competitiveness (Internal Market, Industry and Research)', Brussels, 17 and 18 May 2004, <ue.eu.int/ueDocs/cms_Data/docs/pressData/en/intm/80641.pdf>, visited 2004.10.27.

[192] This proposal took account of discussions at the EU Council Working Group and the Committee of Permanent Representatives. *See* 'Draft Minutes of the 2583rd meeting of the Council of the European Union (Competitiveness (Internal Market/Industry/Research)', held in Brussels on 17 and 18 May 2004, <register.consilium.eu.int/pdf/en/04/st09/st09586.en04.pdf>, last visited 2004.10.27.

[193] Article 4a(1): A computer program as such cannot constitute a patentable invention. Hereinafter, text of the proposed Directive (as amended on 24 May 2004) cited as available at <register.consilium.eu.int/pdf/en/04/st09/st09713.en04.pdf>, visited 2004.11.05.

[194] 'Proposal for a European Parliament and Council directive on the patentability of computer-implemented inventions', Bulletin of the European Union, *European Commission*, May 2004, <europa.eu.int/abc/doc/off/bull/en/200405/p103027.htm>, visited 2004.10.28.

[195] *Supra* note 18.

The evidence from the studies was inconclusive. The American approach was found to have both positive and negative attributes, and it is difficult to judge which are more important in terms of their overall effects. Similarly, as regards the European approach, little evidence was found to suggest that the present practice was causing difficulties, and in particular, that European independent software developers were being unduly affected, at least up to now.

Faced with this situation, the Commission concluded that there was no justification[196] for introducing any significant modification to the present practice. Thus the approach of the proposal for a Directive, as claimed, is *to harmonize*, rather than to change, the legal position, thereby clarifying the legal framework applying to these inventions. In particular, and contrary to American practice, there is no extension of patentability to computer programs 'as such'.

However, substantial differences remain between the positions adopted by the European Parliament and that of the European Commission/European Council of Ministers. These differences relate to the exceptions from patentability for computer-implemented inventions. While the European Parliament wants wide exclusions covering the use of patented technology for interoperability and data handling, the European Commission/European Council of Ministers believe that this will harm EU competitiveness as it goes beyond what is required to set a balance between rewarding inventors and allowing competitors to build on those inventions.[197]

Present position regarding the Draft

It may be interesting to mention some moves in regard to this proposal that had taken place in the Community. From one point of view, the lack of democratic control in the EU's lawmaking system has been a cause of concern for decades. In particular the Council's legislative processes are notoriously nontransparent. One approach to address this problem is the Committee of National Parliaments (COSAC). A protocol to the Amsterdam Treaty[198] assigns this committee important functions in the Council's

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[196] Since there is no research results showing that the net impact of software patents on the economy or on the technological development is positive, in absence of evidences of such benefits and such overall positive effect, therefore software patents should not even be considered. In case those benefits become apparent in the future, the issue could be revisited. *See* J. M. Gonzalez-Barahona, 'EU Consultation on Software Patents Contribution', December 2000, <europa.eu.int/comm/internal_market/en/indprop/comp/barahonaen.pdf>, last visited 2004.11.25.

[197] *Supra* note 179.

[198] The Amsterdam Treaty (adopted at the Amsterdam European Council on 16-17 June 1997 and signed on 2 October 1997 by the Foreign Ministers of the fifteen Member States, entered into force on 1 May 1999) makes substantial changes to the Treaty on European Union signed at Maastricht on 7 February 1992. In a nutshell, the Amsterdam Treaty means a greater emphasis on citizenship and the rights of individuals, more democracy in the

legislative process. These functions, as it seems, have been grossly neglected in the case of the software patent directive. Vrijschrift, the Dutch branch of the FFII, has written a letter to COSAC president Sharon Dijksma, to raise concerns and call for an intervention of COSAC before September 24th, 2004[199], the date when the Council would presumably have met to rubberstamp a "political agreement" reached on 18 May 2004, before being sent back to the European Parliament for a second reading, to remove all limits on patentability of "computer-implemented" algorithms and business methods, thereby "radically overturning the legislative proposals of the European Parliament as well as the consultative organs of the EU".

However, the item was removed from the Council's agenda due to delays in translation[200] and on the Council meeting on 24th of September 2004 under the Presidency of Netherlands a question either about a common patent or computer-implemented inventions patentability was not discussed.[201]

The text agreed upon by Member States on 18 May 2004 was supposed to be approved at the earliest in November. This new delay meant that the European Parliament would only start working on its response to the Council by the end of 2004 or even at the beginning of 2005.[202]

Therefore, the directive was scheduled to be formally adopted without debate at the EU Competitiveness Council of *25-26 November 2004* before being sent back to the European Parliament for a second reading.

The Polish government has announced 17 November, 2004 that it can not support the proposal from the EU Council for a Software Patents directive, since it is too vague, and leaves too much room for patents on pure software and business methods. This means there is no majority in the Council anymore to formally ratify the agreement that was reached on 18 May

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shape of increased powers for the European Parliament, a new title on employment, a Community area of freedom, security and justice, the beginnings of a common foreign and security policy and the reform of the institutions in the run-up to enlargement. The European Council will lay down common strategies, which will then be put into effect by the Council acting by a qualified majority, subject to certain conditions. In other cases, some States may choose to abstain "constructively", i.e. without actually preventing decisions being taken. *See* 'Entry into force of the Amsterdam Treaty on 1 May (Amendment of legal bases)', EU Press Releases, European Communities, 28 April 1999, <europa.eu.int/rapid/pressReleasesAction.do?reference=IP/99/269&format=HTML&aged= 0&language=EN&guiLanguage=en>, visited 2004.10.26.

[199] 'FFII calls on Committee of National Parliaments (COSAC) to review Council Patent legislation', 5 September 2004, <swpat.ffii.org/xatra/cosac040905/index.en.html>, visited 2004.10.28.

[200] 'EU software patents directive delayed', *eGovernment news*, 11 October 2004, <europa.eu.int/ida/en/document/3378/194>, visited 2004.10.28.

[201] 'Press Release of the 2605th Council Meeting, Competitiveness (Internal Market, Industry and Research)', Brussels, 24 September 2004, <ue.eu.int/ueDocs/cms_Data/docs/pressData/en/intm/82067.pdf>, visited 2004.10.28.

[202] *Supra* note 200.

2004.[203] With the Polish 'NO'[204], the Council will have to re-negotiate the draft directive once more within the Council, before being able to present it to the European Parliament for a second reading.[205]

The Commission and the Dutch presidency had hoped that the bill could be referred to Parliament in December but this process could now be stalled unless the bill is modified to take account of Poland's and other countries' concerns.[206]

Currently, "technical" software inventions are considered to be patentable. Case law shows that this distinction often leads to rather arbitrary results. There are "bad" technical patents and "good" non-technical patents. Good patents stimulate innovation. Bad patents create undue monopolies. Will the proposed European Directive for "computer-implemented inventions" be helpful to discriminate between "good" and "bad" patents?[207] Although the outcome of the draft Directive is seen by many industry players as dramatic we shall consider in more detail how the draft corresponds with the questions of improving harmonization and clarifying the law below.

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[203] On 1 November 2004 the voting-procedure in the EU Council was modified to allow the new Member States to have equal amounts of votes.
[204] This is due to a change in the voting weights in the Council of Ministers deriving from the Nice Treaty, which entered into force on 1 November.
[205] 'Poland blocks EU Software Patent Directive', *European Digital Rights (EDRI.org),* 17 November 2004, <www.edri.org/edrigram/number2.22/softpat>, visited 2004.11.23.
[206] 'Software patents law up in the air after Poland pull out', *EurActiv.com*, 19 November 2004, <www.euractiv.com/Article?tcmuri=tcm:29-132419-16&type=News>, visited 2004.11.23.
[207] R.B. Bakels, 'European Parliament Hearing on Software Patentability', <www.europarl.eu.int/hearings/20021107/juri/bakels_en.pdf>, visited 2004.11.24.

5 Draft Directive

Software is nowadays written in source code, rendering merely copyright protection insufficient. Computer programs have now become commercially very important products. Finally, with the availability of comprehensive databases and very powerful electronic search tools, searches can nowadays be readily performed in the field of computer-related inventions as well. Therefore it is difficult to agree with reasons about exclusion of computer programs from patentability, currently they seem to be obviously no longer valid. However, the question remains open to what extend the protection shall be granted.

Also international developments seem to suggest that computer programs should not be excluded from patentability. For example, the USPTO and the JPO[208] have granted patents for computer programs for several years already. Further, Article 27 (1) TRIPS Agreement reads: "Patents shall be available for any inventions, whether products or processes, in all fields of technology, provided they are new, involve and inventive step and are capable of industrial application". Although the TRIPS Agreement does not directly apply to the EPO[209], this article clearly reflects the intention of the TRIPS Agreement not to exclude computer programs from patentability.

In view of these international developments, the European Parliament in its resolution of 19 November 1998 expressed the support to the patentability of computer programs and requested for further preparation of the Directive concerned.

Substantial part

There is no doubt that the draft of the Directive addresses a difficult policy area where there are divisions of opinion, and therefore reflects an attempt to take into account the different interests involved. It is however essential that the resulting text should be clear, and should accurately reflect current law and practice, if it is to achieve its objective. Therefore, for this purposes we shall address some substantive parts of the proposal in more detail.

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[208] While the European Patent Office (EPO) requires the claim to specify a technical feature over and above that represented by the computer alone, the Japan Patent Office is satisfied with a software invention provided the patent claim specifies a computer. This approach can be contrasted with the practice in the US. To obtain a patent in the United States, an invention must be implicitly within the technological arts. Although a "tangible result" is required, the invention does not have to provide a "technical contribution" as such. *Supra* note 187.

[209] However, all EU member-countries are signatories of GATT Treaty.

Technical contribution

Article 4 as presented in the Directive requires a computer-implemented invention to be susceptible of industrial application, to be new and to involve an inventive step. These requirements are basic, universal components of patent laws around the world. Article 4 additionally requires, however, that as a condition of involving an inventive step, a computer-implemented invention must make a "technical contribution". The Resolution explains that the idea behind the "technical contribution" provision is to ensure that patents will not be granted for the mere processing of data. Thus, a business method implemented on a computer would not be patentable if the computer merely processed the business data because the problem being solved in such a situation is business-related, not "technical" and therefore the contribution made is also non-technical. By contrast, the Resolution notes that a method for increasing the processing speed of a computer would be a "technical contribution" because processing speed is "technical" in nature.[210]

Whatever its intent, Article 4 is problematic for diluting the distinction between what constitutes patentable subject matter and what constitutes an inventive step.

Generally, an invention must first fall within a legally defined category of inventions in order to be patented, i.e., it must first comprise patentable subject matter. The inventive step requirement (referred to as "non-obviousness") ensures that, even though an invention falls within the scope of patentable subject matter, a patent may not be granted if the difference between the invention and what was known at the time it was made (referred to as the "prior art") is something that would have been obvious to a person of ordinary skill in the relevant field of the invention.

As some critics consider the "technicality" inquiry is already a part of the patentable subject matter test in Europe by virtue of the requirement of "invention" in European Patent Convention Article 52. By including a "technicality" inquiry in the inventive step test as well, the language of Article 4, most probably, inappropriately combines two requirements that are intended to serve two different purposes within the patent law.[211]

The second concern, which is related to the blurring of the patentable subject matter and inventive step requirements, is that the invention may not be considered as a whole when determining issues of patentability. The

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[210] 'U.S. Comments on the draft European Parliament amendments regarding the proposed European Union Directive on the patentability of computer-implemented inventions', <www.aplf.org/mailer/USCommentsPatentCompImplInv.pdf>, visited 2004.10.23.
[211] *Ibid.*

experience of the United States in the case of *Diamond v. Diehr*[212] may help to illustrate the point.

In *Diehr*, the invention was a rubber molding process that used a programmed digital computer to calculate a mathematical formula to improve curing of the rubber. It was argued that invention was unpatentable because all of the parts of the rubber- molding machine were known, and the only "new" part was a mere mathematical formula or algorithm, which under U.S. patent law (and under European patent law) is not patentable subject matter. The U.S. Supreme Court rejected this "piecemeal" approach to patentability, recognizing that "if carried to its extreme, [such an analysis would make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make the implementation obvious".[213]

Article 4, however, seems to contemplate the same type of analysis because it defines patentability solely in terms of the type of contribution made by a part of the invention, irrespective of the character of the invention as a whole or whether the differences between the invention as a whole and the prior art would have been obvious to the person skilled in the art.[214]

Despite the foregoing comments, they understand that the language of Article 4 is intended to codify current practice at the European Patent Office (EPO) and suffice, however, that further discussions between the United States, the member states of the EU and the EPO are essential in order to continue progress in this area as well as for the Trilateral Patent Offices[215] and the World Intellectual Property Organization toward increased cooperation and a harmonized international patent system. Thus the suggestion is, if this provision is maintained in the final Directive, the need for continued discussion of these matters should be recognized. Therefore, the monitoring and reporting required by Articles 7 and 8 of the Directive should additionally provide for monitoring and reporting of whether the technical contribution standard, both generally and as particularly defined with regard to inventive step, represents the best standard for innovation policy with respect to computer-implemented inventions particularly, and other inventions generally.[216]

The overly discussed problem is the definition of technical contribution of computer-implemented inventions.[217] The requirement of its definition in

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[212] 450 U.S. 175 (1981)

[213] *Supra* note 210.

[214] *Ibid.*

[215] Working group of the major patent offices, EPO, JPO and USPTO, and related government officials, influential in framing patent policies at a world level. *See* 'Trilateral Project', <swpat.ffii.org/players/useujp/index.en.html>, visited 2004.10.27.

[216] *Supra* note 210.

[217] Article 2(a) of proposal states, "computer-implemented invention" means any invention the performance of which involves the use of a computer, computer network or other

Article 2(b)[218] that the technical contribution should be "non-obvious" is confusing. Article 4[219] states that an "inventive step" (equivalent to non-obviousness) must involve a "technical contribution" and to then state in Article 2 (b) that this technical contribution must itself be non-obvious makes the combination of the two articles a circular statement.

Article 2 (b) might be read as requiring that the technical difference between the invention and the prior art should itself be non-obvious. That would impose a further limitation on what is patentable over and above the practice of the EPO.[220]

There may be a technical advance - an increase in speed, say, or a reduction in the use of resources - that is itself obviously desirable. Provided that technical effect is brought about in a non-obvious way the invention should be patentable even though it results from non-technical features such as the algorithm used. *Further explanation of* this aspect would be helpful, for instance by including a recital that built on the explanation of Article 4 to be found, or even simply stated that a computer-implemented invention is patentable if it is the *solution to a technical problem.* [221]

Moreover, according to Article 4a(2)[222] the technical implementation must go beyond merely using a known computer in a straightforward manner to implement the method. In such a case the technical contribution results from the technical considerations that are at the root of the claimed invention. This is widely accepted where mathematical concepts are involved and it appears appropriate to apply the same reasoning to other kinds of methods, including business methods.

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programmable apparatus, the invention having one or more features, which are realized wholly or partly by means of a computer program or computer programs. *Supra* note 193.
[218] Article 2(b): "technical contribution" means a contribution to the state of the art in a field of technology, which is new and *not obvious* to a person skilled in the art. The technical contribution shall be assessed by consideration of the difference between the state of the art and the scope of the patent claim considered as a whole, which must comprise technical features, irrespective of whether or not these are accompanied by non-technical features.
[219] Article 4: In order to be patentable, a *computer-implemented invention must* be susceptible of industrial application and new and *involve an inventive step*. In order *to involve an inventive step*, a computer-implemented *invention must make a technical contribution*.
[220] 'Proposal for a Directive on the Patentability of Computer-Implemented Inventions', Comments of the *Federation of the Electronics Industry and Computing Services & Software Association*, 9 May 2002, <www.intellectuk.org/publications/position_papers/fei/Patentability_of_computer-implemented_inventions_2.pdf>, visited 2004.11.07.
[221] *Ibid.*
[222] A computer-implemented invention shall not be regarded as making a technical contribution merely because it involves the use of a computer, network or other programmable apparatus. Accordingly, inventions involving computer programs, whether expressed as source code, as object code or in any other form, which implement business, mathematical or other methods and do not produce any technical effects beyond the normal physical interactions between a program and the computer, network or other programmable apparatus in which it is run shall not be patentable.

Therefore, as it seems, it was proposed that an *inventive technical contribution* will be an essential prerequisite for inventive step. And then computer programs should be patentable provided that the invention claimed makes a *technical contribution to the art,* which is not derived merely from the execution of the program.

Relation with Computer program Directive 91/250

The other area of uncertainty is the intended relationship between this Directive and Directive 91/250 EC on the legal protection of computer programs.[223] A provision is proposed to leave acts permitted under that earlier Directive unaffected (proposed Article 6[224]).

The proposal does not clearly set out to extend the "fair use" exceptions for patent infringement to those provided by that earlier Directive (*e.g.* reverse compiling to achieve interoperability), but it might be interpreted that an act that is not a copyright infringing act should also not be a patent infringing act. Such an interpretation would indeed extend the bounds of fair use. [225]

This article provides a limited exception to patent rights by permitting developers to reverse-engineer patented software for the purpose of achieving interoperability. The justification given for this provision is to "ensure that developers of software can continue to engage in the same acts to achieve interoperability under patent law as they are allowed today within the limits of copyright law", referring to Articles 5 and 6 of the EU Software Copyright Directive (91/250/EEC).[226]

Article 6 ensures that such acts would apply equally to any intermediate copies of a program made in the course of reverse engineering that is lawful under the Computer Directive, if claims to programs were permitted.[227]

Due to the fact that this reverse-engineering exception applies only to computer-implemented inventions, the EU may wish to consider whether Article 6 complies with Article 27(1) of the TRIPS Agreement, which prohibits discrimination in the enjoyment of patent rights based on the field of technology involved. As recognized in Article 28(1)of the TRIPS Agreement, one of the fundamental rights conferred by a patent is the right

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[223]Article 6: The rights conferred by patents granted for inventions within the scope of this Directive *shall not affect acts permitted* under Articles 5 and 6 of Directive 91/250/EEC on the legal protection of computer programs by copyright, *in particular* under the provisions thereof in respect of *decompilation and interoperability.*
[224] Text of Article 6: The rights conferred by patents granted for inventions within the scope of this Directive shall not affect acts permitted under Articles 5 and 6 of Directive 91/250/EEC on the legal protection of computer programs by copyright, in particular under the provisions thereof in respect of decompilation and interoperability.
[225] *Supra* note 158.
[226] *Supra* note 210.
[227] *Supra* note 220.

to prevent others from making or using the invention without authorization. As Article 6 provides an exception to this right only for computer-implemented inventions, it might be argued that it discriminates against such inventions contrary to the requirements of Article 27(1) of the TRIPS Agreement.

Moreover, the justification given for this provision, i.e., that developers should be permitted to infringe under patent law to the same extent permitted under copyright law, does not appear to account for the different purposes served by patent and copyright protection. Patents protect inventions. Copyright protects an author's particular expression of an idea. Justifying the permissibility of acts with respect to the patent law on the basis that similar acts are permissible under copyright law does not appear to be appropriate, as the subject matter protected and the standards for obtaining protection under these two systems are completely different. [228]

However, as Mr. Bolkestein replied on behalf of the Commission (7 March 2003), nothing in the Directive should deprive schools or charitable organizations of the possibility to do anything, which is currently free for them. Moreover, the laws of the Member States governing patent infringement in general (which will continue to apply) do not normally extend to acts done privately and for non-commercial purposes. The Commission does not intend that this situation should change. [229]

In any case, there is a belief that Article 6 should be reconsidered. One reason is that the scope of the provision is not limited to just decompilation or interoperability; the draft article generally provides that whatever is permitted under the copyright directive shall also be permitted under the draft software patent directive.

Political considerations

Novell's vice chairman Chris Stone has often called this famous deal with Munich shift for Linux system as "the poster child for the desktop Linux movement". Novell now owns German Linux maker SUSE, which was brought into the Munich deal by IBM to develop a Linux plan. IBM made a USD 50 million investment in Novell at the time Novell's acquisition of SUSE. [230]

Clearly, the decision to use Linux, said Munich Mayor Christian Ude in the statement, will not only ensure that the city has greater IT independence, but

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[228] *Supra* note 210.
[229] 'Written Question E-0194/03 by Theresa Villiers (PPE-DE) to the Commission, 31 January 2003', Answer given by Mr. Bolkestein on behalf of the Commission (7 March 2003), *Official Journal of the European Union*, <europa.eu.int/eur-lex/pri/en/oj/dat/2003/ce161/ce16120030710en01920193.pdf>, visited 2004.10.29.
[230] 'Munich Linux decision official', *DesktopLinux.com*, 14 June 2004, <www.desktoplinux.com/news/NS7137390752.html>, visited 2004.10.29.

it will also "set a clear signal for greater competition in the software market".[231]

What is Linux?

Linux[232] is a version of Unix that runs on a variety of hardware platforms and is widely used for servers. As open source software, it is free, although it is distributed for a fee, along with technical support, by suppliers such as Red Hat and SUSE. [233]

Linux is actually just the kernel. The tools, drivers, applications and graphical user interfaces that make up the rest of Linux come mostly from the Free Software Foundation's GNU[234] project. Hence GNU/Linux. [235]

Low cost of ownership is key, although as organisations meet the overheads of migration, Linux is proving far from free. But there is a huge armoury of freely-downloadable utilities and development tools, a large and supportive community to push development and help with problems, and a growing range of professional service organisations.[236] However, there is a critic of the Open Source Initiative (OSI) for issuing too many types of open-source licence - over 50.

Suits against Linux

Linux has suffered a couple of setbacks in its previously unstoppable rise. One is the lawsuit by SCO Group[237] against other Linux suppliers - and threat of suing users - claiming that some versions contain proprietary code. Although Novell and other suppliers have promised to bear litigation costs,

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[231] J. Blau, 'Munich chooses SuSE Linux over Microsoft', *IDG News Service*, 28 May 2003, <www.computerworld.com/softwaretopics/os/linux/story/0,10801,81588,00.html>, visited 2004.10.29.

[232] In 1991, University of Helsinki student Linus Torvalds asked for help with a free operating system he described as "just a hobby; won't be big and professional". However, Gartner predicts that by 2008 Linux will have 23% of the server market.

[233] N. Langley, 'Hot skills: More companies are using Linux despite lawsuits and cost issues', *ComputerWeekly.com,* 12 October 2004, <www.computerweekly.co.uk/Article134059.htm>, visited 2004.11.06.

[234] The GNU Project has developed a complete free software system named `GNU'' (GNU's Not Unix) that is upwardly compatible with Unix. Richard Stallman's initial document on the GNU. Project is called the GNU Manifesto. *See* 'Overview of the GNU Project', <gnu.te8.com/gnu/gnu-history.html>, visited 2004.11.25. In the GNU project, it is used "copyleft" to protect these freedoms legally for everyone.

[235] *Supra* note 233.

[236] *Ibid.*

[237] The SCO Group (SCO) is a provider of software solutions for small- to medium-sized businesses (SMBs) and replicated branch offices. SCO solutions include UNIX platforms; messaging, authentication, and e-business tools; and services that include technical support, education, consulting, and solution provider support programs. See <www.sco.com/>, visited 2004.11.25.

smaller distributors and the free software community can make no such undertakings. [238]

Because open-source code tends to be created by diverse groups of developers who write code that can be easily scrutinized, some critics have said that it may be easier for companies to make IP claims against it.

Despite SCO failing to make much progress in its lawsuits against IBM and others for allegedly infringing its Unix software copyrights, uncertainty over patents remains, and is causing the City of Munich to ask German politicians to clarify the legal issues. Any problems resulting from SCO's legal actions could have important ramifications.

It is clear the stakes are high. "If IBM can get a large part of [SCO's] suit dismissed out of hand, then much of the problem will go away and the community will relax", Becknell said. "If this case goes to trial, it could potentially get really ugly and affect the community. Then who owns what will become important. So if IBM/ HP continue to promise to protect and aid their customers, and enough of the other partners go along with them, then that should be good enough for most customers to continue with open-source". [239]

Nowadays, there are many Linux based projects all over the world: Brazil trains government sector in Linux[240], China set to "build software economy" on Linux, Munich, Vienna, Bergen etc. - the transition in Munich is being watched closely by many corporations and government bodies considering a similar move to open-source operating environments. This expectation bring more stress on the outcome in the situation, which as is believed to depend largely on the stance taken by politicians.

Differences between the US and European law were adding to the complexity, though the outcome of the German project could help to set a precedent.[241] If the Munich project is seen to be successful, it could encourage more firms and governments elsewhere to adopt open-source systems.

On the 29 of September Munich, Germany's third-largest city, decided to take a calculated risk of software patent infringement concluded as "very small" in the words of Stefan Hauf, a spokesman for the city, and proceed with a plan to equip all 14,000 computers in its public administration with Linux and other open-source office applications, despite concerns of

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[238] *Supra* note 233.
[239] *Supra* note 11.
[240] 'Brazil trains government sector on Linux', *DesktopLinux.com*, 29 April 2004, <www.desktoplinux.com/news/NS3811026125.html>, visited 2004.10.29.
[241] *Supra* note 11.

possible software patent infringements raised in the debate over new European Union patent legislation.[242]

Finals

As it was claimed the proposed directive has as objectives to confirm and maintaining the status quo of a limited software patentability, to improve legal certainty and unity of law.

Starting with the last objective, a European Directive may improve the unity of law, as member states' courts are required to interpret the law in conformity with the directive, eventually under the supervision of the European Court Of Justice.

The Directive would have no direct legal effect on the European Patent Office. However, once the Directive was implemented, the Commission would consider taking action to resolve any inconsistencies in the context of the European Patent Convention.[243] In any case, European Patents, once granted, become subject to national laws, so any patents granted after the Directive took effect and which were inconsistent with its provisions would need to be amended to bring them into conformity (or be revoked).[244] Thus the grant itself of European patents by the European Patent Office would not be harmonized by the directive. So, at best, the proposed directive would reach this objective only in due course as case law is created.

Concerning the second objective, there are serious doubts as to whether the proposed directive will improve legal certainty. The "technical contribution" concept introduced by the proposed directive is *not* an improvement. At first sight, it seems logical not to allow patents for inventions lacking such a contribution. But in practice, a "technical contribution" requirement is likely to increase rather than decrease confusion. The directive does not define the concept of "technology".[245] If however the courts have to decide what "technology" means on a case-by-case basis[246], the proposed directive fails to meet one of its prime objectives.

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[242] J. Blau, ,Munich migrates to Linux despite EU debate', *ComputerWorld.com*, 20 September 2004, <www.computerworld.com/softwaretopics/os/story/0,10801,96288,00.html>, visited 2004.10.29.

[243] This has already been done on a previous occasion (with the Biotechnology Patents Directive – 98/44/EC), with no particular difficulty.

[244] *Supra* note 147.

[245] The associated *Frequently Asked Questions* document explains that "technology" *cannot* be defined because patent law naturally deals with leading edge technology, which is in constant change.

[246] As is proposed in the FAQ document. Some observers see that the difficulties in defining and handling the concept of "technology" are symptomatic for the fact that it is

Concerning the first objective – maintaining the status quo of limited software patentability – the proposed "technical contribution" requirement is apparently intended to prevent "business method" patents. While there is little agreement about software patentability, most consulted Europeans are opposed to business method patents. If business method patents were to be categorically excluded, probably it would be more appropriate to prohibit such patents as a category by an explicit legal provision, rather than indirectly by means of a "technical contribution" requirement.[247]

Disregarding the comments above, the decision of one city does not solve the problems of the whole region and European legislators still have to continue with the work of the proposal on Directive for patentability of computer implemented inventions, because as it seems its language leaves many spaces for further troubles in the treatment of computer programs and there remains a significant issues of uncertainty as to whether the required legislative changes envisaged by the draft Directive would in fact bring about the intended changes at the national level (for example, whether national legislators might be able to interpret their existing legislation as being entirely in line with the Directive)[248] and it is obviously the fact that this decision affects the international community.

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hard to draw the dividing line between "desirable" and "undesirable" patents. The distinction may not be related to the technology "content" of inventions at all.
[247] Bakels, *supra* note 207.
[248] *Supra* note 158.

Supplement A

Here are listed several short versions of decisions of Technical Board of Appeal of EPO and abstracts from applications to patent discussed.

1) T 26/86 (*Koch & Sterzel*; EP 0 001 640)[249]

Decision of Technical Board of Appeal, dated 21 May 1987, T 26/86
Patent proprietor/Respondent: Koch & Sterzel GmbH & *Co.*
Opponent/Appellant: Siemens AG
Opponent/Appellant: Philips Patentverwaltung GmbH
Article: 52 (1), (2) and (3), 56 EPC

Headnote
I. The EPC does not prohibit the patenting of inventions consisting of a mix of technical and non-technical features.
Il. In deciding whether a claim relates to a computer program as such it is not necessary to give a relative weighting to its technical and non-technical features. If the invention defined in the claim uses technical means, if can be patented provided it meets the requirements of Articles 52 to 57 EPC.

Headnote:
1. An invention consisting of a mixture of technical and non-technical features and having technical character as a whole is to be assessed with respect to the requirement of inventive step by taking account of all those features which contribute to said technical character whereas features making no such contribution cannot support the presence of inventive step.
2. Although the technical problem to be solved should not be formulated to contain pointers to the solution or partially anticipate it, merely because some feature appears in the claim does not automatically exclude it from appearing in the formulation of the problem. In particular where the claim refers to an aim to be achieved in a non-technical field, this aim may legitimately appear in the formulation of the problem as part of the framework of the technical problem that is to be solved, in particular as a constraint that has to be met.[250]

T 26/86 (*Koch & Sterzel*; EP 0 001 640)
Claim 1: X-ray *apparatus* for radiological imaging having an input unit both for selecting one of several X-ray tubes with adjustable focal spot size and rotating anode speed and for selecting X-ray tube current and exposure time, said apparatus also having a *data processing unit* which stores the X-ray tube rating curves for different exposure parametres and users these to set the tube voltage valuesfor the exposure parameters selected, characterised in

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[249] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t860026ep1.htm>, visited 2004.10.25.
[250] 'Software and Business Methods', *Gevers & Vander Haeghen*, 2003, <www.european-patent-office.org/epidos/conf/patlib2003/pdf/pres/quintelier_te.pdf>, visited 200.11.21.

that: in order to ensure optimum exposure with sifficient protection against overloading of the X-ray tube within any given routine, the data processing unit:

a) initially maintains both the X-ray tube voltage and the product of tube current and exposure time constant, while decreasing the tube current from the maximum permissible value until the relevant rating curve permits an exposure;

b) where no exposure is possible and the maximum permissible exposure time has been reached, increases the tube voltage and decreases the tube current as a function of the secondary requirement of constant density until the relevant tube rating curve does allow an exposure;

c) determines the exposure parametres, firstly on the basis of the rating curve of the smallest focal spot optimum for image resolution and of the standard speed of the rotaiting anode, and, where exposure is not permitted, compares the exposure parametres selected with the nearest-to-optimum ratingcurves for image resolution for different focal spot values and with the anode rotation speed, starting with the curves for the smallest focus spot and a faster anode rotation speed;

and in that *means* are also provided *to transmit* the exposure parameter *values obtained from the data processing unit* under the given routine, via appropriate selection circuits *to an operating* and supply *circui*t in order *to set high-voltage generator*.

2) T 1173/97 (*IBM*; EP 0 457 112 B1)

Decision of Technical Board of Appeal, dated 1 July 1998,
Applicant: International Business Machines Corporation
Article: 23(3), 52(1), 52(2)(c), 52(3) EPC; Rule: 27, 29 EPC; Guidelines C-IV, 2.3; TRIPS: Article 10,27(1),27(2),27(3); Vienna Convention: Article 4, 30, 31(1),31(4)

Headnote:
A computer program product is not excluded from patentability under Article 52(2) and (3) EPC if, when it is run on a computer, it produces a further technical effect which goes beyond the "normal" physical interactions between program (software) and computer (hardware).[251]

T 1173/97[252]
Claim 1: A *method for resource recovery in a computer system*, said method, running an application, said application requesting a work operation involving a resource, said method comprising the steps of:
attempting to implement a commit procedure for said work request, wherein the commit procedure is not completed due to a failure at some time after said commit procedure fails;

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[251] *Ibid.*
[252] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t971173ex1.htm>, visited 2004.10.25.

notifying said application that it can continue to run, whereby said application need not wait for resynchronization; and
while said application continues to run, resynchronizing said incomplete commit procedure for said resource asynchronously relative to said application.

Claim 14: a *computer system* comprising:
An execution environment for running an application, and
means for implementing a commit procedure, especially a two-phase commit procedure for said application;
characterized by:
means for notifying said application to continue to run in the event said commit procedure fails before completion, whereby said application need not wait for said commit procedure to be completed; and
means for resynchronizing said incomplete commit procedure asynchronously relative to said application.
Claim 20: A *computer program* comprising program *code means* for performing all the steps of any one of the *claims 1 to 13* when said program is run on a computer.

Claim 21: A *computer program product* comprising program code means stored on a computer readable medium for performing the method of any one of the claims 1 to 13 when said program is run on a computer.

3) T 1194/97[253] (Philips; EP 0 500 927):
Claim 1: A *picture retrieval system* comprising a record carrier and a read device, a coded picture composed of consecutive coded picture lines being recorded in a contiguous track of the record carrier, which track has been provided with addresses, the read device comprising a read head for reading the recorded coded picture lines by scanning the track, means for moving the read head to a track portion having a selected
address, characterized in that together with the coded picture lines line synchronizations and line numbers have been recorded on the record carrier, each line number specifying the sequence number of the relevant coded picture line in the coded picture, and each line synchronization specifying the beginning of the relevant coded picture line, the coded picture lines having a variable code length, addresses for a number smaller than the total number of coded picture lines of the coded picture being also recorded on the record carrier, which addresses specify where the relevant picture lines have been recorded in the track, the device comprising means for selecting a coded picture line within a selected coded picture, means for reading recorded addresses for a number smaller than the total number of picture lines of the selected picture, means for selecting on the basis of the addresses thus read a track portion situated before the track portion where the recording of the selected coded picture line begins, and means for causing the read head to be moved to the selected track portion, and means

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[253] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t971194ex1.htm>, visited 2004.10.25.

for subsequently detecting the read-out of the beginning of the selected coded picture line on the basis of the read-out line numbers and line synchronization.

Claim 4: A *record carrier for use in the system as claimed in claim 1*, a coded picture composed of consecutive variable length coded picture lines being recorded in a contiguous track of the record carrier, which track has been provided with addresses, characterized in that together with the coded picture lines line synchronizations and line numbers have been recorded on the record carrier, each line number specifying the sequence number of the relevant coded picture line in the coded picture, and each line synchronization specifying the beginning of the relevant coded picture line, the coded picture lines having a variable code length, addresses for a number smaller than the total number of coded picture lines of the coded picture being also recorded on the record carrier, which addresses specify where the relevant picture lines have been recorded in the track.

4)   T 158/88 (*Siemens*; EP 0144 656 A1)

Decision of Technical Board of Appeal, dated 12 December 1989,
T 158/88
Applicant: Siemens AG
Article: 52(1); 52(2)(c); 52(3)' EPC

Headnote
I. The statement in a patent claim that technical means (in this case a visual display unit) are to be used to carry out a process is not alone sufficient to render patentable within the meaning of Article 52(1) EPC a process which is in essence a computer program as such.
Il. A computer program is not considered part of a technical operating procedure if the claimed teaching merely modifies the data and produces no effects beyond information processing.
III. If the data to be processed by a claimed process neither constitute the operating parameters of a device (but, as here, forms the word elements of a language) nor affect the physical/technical functioning of the device (but, as here, supply visual information for a viewer) and if the claimed process does not solve a technical problem (but, as here, generates complete orthographically correct character forms), the invention defined in the claim does not use technical means and under Article 52(2) (c) and (3) EPC cannot be regarded as patentable within the meaning of Article 52(1) EPC (Cf T 26/86, 'X-ray apparatus/ KOCH & STERZEL ", OJ EPO 1988, 19.)[254]

T 158/88 (*Siemens*; EP 0144 656 A1)[255]

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[254] *Supra* note 250.
[255]   EPO   boards   of   appeal   decisions,   <legal.european-patent-office.org/dg3/biblio/t880158ep1.htm>, visited 2004.10.25.

Claim 1: process for displaying on a visual display unit, in which characters are displayed in isolated form, start form, middle form or end form depending on their position in a word, characterized in that,

- a) a first character (Z1) is initially displayed in a first complete basic form on a screen (AE),

- b) if a second character (Z2) is then entered, it is displayed in a second complete basic form and the first character (Z1) already displayed on the screen (AE) is replaced by a character (Z1) in its complete start form,

- c) if the first basic form differs from the start form and no further character is entered, the first character (Z1) already displayed on the screen (AE) is replaced by a character (Z1) in its complete isolated form,

- d) if further characters (Z3) in the word are entered, these are displayed in their complete second basic form on the screen (AE) and the preceding characters (Z2) already displayed are replaced by characters (Z2) in their complete middle form, and

e) if no further character is entered, the last character (Z3) already displayed on the screen (AE) is replaced by a character (Z3) in its complete end form.

5) T 208/84 (*Vicom*; EP 0 005 954)[256]

Claim1: *A method of digitally processing images* in the form of a two-dimensional data array having elements arranged in rows and columns in which an operator matrix of a size substantially smaller than the size of the data array is convolved with the data array, including sequentially scanning the elements of the data array with the operator matrix, characterized in that: the method includes repeated cycles of sequentially scanning the entire data array with a small generating kernel operator matrix to generate a convolved array and then replacing the data array as a new data array; the small generating kernel remaining the same for any single scan of the entire data array and although comprising at least a multiplicity of elements, nevertheless being of a size substantially smaller than is required of a conventional operator matrix in which the operator matrix is convolved with the data array only one, and the cycle being repeated for each previous new data array by selecting the small generating kernel operator matrices and the number of cycles according to conventional error minimization techniques until the last new data array generated is substantially the required convolution of the original data array with the conventional operator matrix.

Claim 8: *Apparatus for carrying out the method in Claim 1* including data input means (10) for receiving said data array, and said data array to generate an operator matrix for scanning said data array to generate the required convolution of the operator matrix and the data array, characterized in that there are provided *feedback means* (50) for transferring the output of the *mask means* (20) to the data input means, and control means (30) for causing the scanning and transferring of the output of the mask means (20) to the data input means to be repeated a predetermined number of times.

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[256] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t840208ep1.htm>, visited 2004.10.25.

6) T 796/92 (*Sohei*; EP 0 209 907)

Decision of Technical Board of Appeal, dated 31 May 1994, T 769/92
Applicant: Sohei, Yamamoto, et al
Article: 52(1), (2) and (3), 111(1) EPC

Headnote
I. An invention comprising functional features implemented by software (computer programs) is not excluded from patentability under Article 52(2)(c) and (3) EPC if technical considerations concerning particulars of the solution of the problem the invention solves are required in *order to* carry out that same invention. Such technical considerations lend a technical nature to the invention in that they imply a technical problem to be solved by (implicit) technical features.
An invention of this kind does not pertain to a computer program as such under Article 52(3) EPC.
II. Non-exclusion from patentability cannot be destroyed by an additional feature which as such would itself be excluded, as in the present case features referring to management systems and methods which may fall under the "methods for doing business" excluded from patentability under Article 52(2)(c) and (3) EPC (following established case law according to which a mix of features, some of which are excluded under Article 52(2). and (3)_EPC and some of which are not so excluded, may be patentable (in contrast to recent case law concerning inventions excluded by Article 52(4) EPC, see T 820/92, OJ EPO 1995, 113, according to which one feature excluded under Article 52(4) EPC suffices for the whole claim to excluded from patentability).[257]

T 796/92[258] (*Sohei*; EP 0 209 907)
Claim 1: A *computer system* for plural types of independent management including at least financial and inventory management comprising:
a display unit (4), an input unit (3), a memory unit (2), an output unit (4, 5) and a digital processing unit (1) wherein: said display unit (4) displays, in the form of an image on the screen of the display unit (4), a single transfer slip (Figure 2) having a format commonly used for at least financial and inventory management in order that items relating to at least a debit item, a credit item and a commodity item may be input successively,
said memory unit (2) includes:
- a journalized daybook file having a plurality of storage areas for storing data entered with use of said transfer slip format for each transfer slip,
- an item master file for storing data necessary for management processing with respect to a plurality of items in correspondence to each item code,
- a commodity master file for storing data necessary for management processing with respect to a plurality of commodities in correspondence to each commodity

[257] *Supra* note 250.
[258]   EPO   boards   of   appeal   decisions,   <legal.european-patent-office.org/dg3/biblio/t920769ex1.htm>, visited 2004.10.25.

code,
- a journalized daybook accumulation file for storing data relating to the financial management among the data in said journalized daybook file for each transfer slip, and
- an inventory file for storing data relating to the inventory management among the data in said journalized daybook file for each transfer slip, and said digital processing unit (1) comprises:
- first processing means for causing said display unit (4) to display said transfer slip and for automatically displaying data entered through said input unit (3) and storing said data in accordance with said transfer slip into said journalized daybook file
in the memory unit (2),
- second processing means for automatically updating data corresponding to each item code in said item master file and data corresponding to each commodity
code in said commodity master file with use of data entered through said input unit (3),
- third processing means for transferring data necessary for financial management processing stored in said journalized daybook file to said journalized daybook accumulation file to store therein and for relating data stored in said journalized daybook accumulation file with item codes in said item master file,
- fourth processing means for transferring data necessary for inventory management processing stored in said journalized daybook file to said inventory file to
store therein and for relating data stored in said inventory file with commodity codes in said commodity master file, and
- fifth processing means for reading, in response to an output command entered through said input unit (3), data necessary for a specific type of management from at least one of said journalized daybook file, item master file, commodity master file, journalized daybook accumulation file and inventory file to output them through said output unit (4, 5) in accordance with a predetermined format for said specific type of management.

Claim 2: A *method for operating a general-purpose computer management system* including a display unit (4), an input unit (3), a memory unit (2), an output unit (4,
5) and a processing unit (1), for plural types of independent management including at least financial and inventory management *comprising the steps of*:
- providing said memory unit (2) for storing a general-purpose management program and data necessary for management including a journalized daybook file, an item master file, a commodity master file, a journalized daybook accumulation file, and an inventory file,
- providing a single transfer slip (Figure 2) by displaying it in the form of an image on the screen of said display unit, said transfer slip having ... [further wording of this step identical with wording of function of display unit (4) as defined in Claim 1 (see above)],

- automatically entering data successively input through said input unit (3) into the transfer slip, storing said data in accordance with the format of said transfer slip ... [further wording corresponding to function of first processing means],
- updating said data ... [further wording identical with that of function of second processing means],
- transferring said data ... [further wording identical with that of function of third processing means],
- transferring said data ... [further wording identical with that of function of fourth processing means], and
- reading, ... [further wording identical with that of function of fifth processing means]".

7) T 931/95 (*Pension Benefit Systems*) (EP 0 332 770 A)

Decision of Technical Board of Appeal, dated 8 September 2000, T 931/95
Applicant: Partnership
Article: 52(1), (2), (2)(c),(3); 56; 84 EPC; Guidelines: C-IV, 1.1, 1.2,2.2

Headnote
I. Having technical character is an implicit requirement of the EPC to be met by an invention in order to be an invention within the meaning of Article 52(1) EPC (following decisions T 1173/97 and T 935/97)
Il. Methods only involving economic concepts and practices of doing business are not inventions within the meaning of Article 52(1) EPC. A feature of a method which concerns the use of technical means for a purely non-technical purpose and/or for processing purely non-technical information does not necessarily confer a technical character on such a method.
III. An apparatus constituting a physical entity or concrete product, suitable for performing or supporting an economic activity, is an invention within the meaning of Article 52(1) EPC.
IV. There is no basis in the EPC for distinguishing between "new features" of an invention and features of that invention, which are known from the prior art when examining whether the invention concerned may be considered to be an invention within the meaning of Article 52(1) EPC. Thus there is no basis in the EPC for applying this so-called contribution approach for this purpose (following decisions T 1173/97 and T 935/97).[259]

T 931/95[260] (EP 0 332 770 A)
Claim 1: A *method of controlling a pension benefits program* by administering at least one subscriber employer account on behalf of each subscriber employer's enrolled employees each of whom is to receive periodic benefits payments, said method comprising:

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[259] *Supra* note 250.
[260] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t950931eu1.htm>, visited 2004.10.25.

providing to a data processing means information from each said subscriber employer defining the number, earnings and ages of all enrolled employees of the
said subscriber employer;
determining the average age of all enrolled employees by average age computing means;
determining the periodic cost of life insurance for all enrolled employees of said subscriber employer by life insurance cost computing means; and
estimating all administrative, legal, trustee, and government premium yearly expenses for said subscriber employer by administrative cost computing means;
the method producing, in use, information defining each subscriber employer's periodic monetary contribution to a master trust, the face amount of a life insurance policy on each enrolled employee's life to be purchased from a life insurer and assigned to the master trust and to be maintained in full force and effect until the death of the said employee, and periodic benefits to be received by each enrolled employee upon death, disability or retirement.

Claim 5: An *apparatus for controlling a pension benefits system* comprising:
a data processing means which is arranged to receive information into a memory from each subscriber employer defining the number, earnings and ages of all enrolled employees, said data processing means including a processor which includes:
A. average age computing means for determining the average age of all enrolled employees;
B. life insurance cost computing means for determining the periodic cost of said life insurance for all enrolled employees of said subscriber employer;
C. administrative cost computing means for estimating all administrative, legal, trustee, and government premium yearly expenses for said subscriber employer;
the apparatus being arranged to produce, in use,
information defining each subscriber employer's monetary contribution to a master trust;
the face amount of each life insurance policy to be issued and made payable to said master trust by a life insurer on the life of each enrolled employee and to be maintained in full force and effect until the death of the said employee; and
periodic benefits payable by said master trust to each enrolled employee upon death, disability, or retirement.

8) T 1002/92[261] (EP 0 086 199)
Claim 1: *System for determining the queue sequence for serving customers* at a plurality of service points, comprising:

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[261] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t921002ex1.htm>, visited 2004.10.25.

a turn-number allocating unit (4) for allocating a turn-number to every customer desiring to be served;

a plurality of terminals (3_1, 3_2, 3_3, 3_4), one for each service point, and an information unit (2) receiving signals identifying the particular turn-number to be served and the particular free service point for indicating them to the customers, characterized in that the system comprises:

a selection unit (5) associated with the turn-number allocating unit (4) in a turn-number device (1), enabling customers to select a desired service point among said plurality of service points,

computing means (6) for memorizing the sequence of allocated turn-numbers with the selected desired service points, for receiving from the plurality of terminals (3_1, 3_2, 3_3, 3_4) signals identifying a particular service point which is free for serving a customer, for deciding which particular turn-number is to be served at the particular free service point and for feeding-out signals identifying this particular turn-number and the particular free service point to the information unit (2), the particular turn-number to be served being the next in turn in the memorized sequence of allocated turn-numbers for which no desired service point is selected or for which the selected desired service point is the particular free service point.

9) T 935/97[262] (IBM; EP 0 767 419 A)

Claim 1: A *method* in a data processing system *for displaying information*, wherein said data processing system includes a display and an operating system, said

method comprising the steps of:

displaying information within a first window in said display using information display software;

detecting a second window displayed in said display at a location that obscures a portion of said information displayed in said first window;

notifying said information display software of the detection; and

displaying in said first window said portion of said information that had been obscured by said second window, including moving said portion of said information that had been obscured by said second window to a location within said first window that is not obscured by said second window, using said information display software.

Claim 5: A *data processing system for displaying information,* wherein said data processing system includes a display, and an operating system, said data processing system comprising:

means for displaying information within a first window in said display utilising information display software;

means for detecting a second window displayed in said display at a location that obscures a portion of said information displayed in said first window;

means for notifying said information display software that said portion of said information within said first window is obscured by said second window; and

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[262] EPO boards of appeal decisions, <legal.european-patent-office.org/dg3/biblio/t970935eu1.htm>, visited 2004.10.25.

means within said information display software *for displaying* in said first window said portion of said information that had been obscured by said second window, wherein said information in said first window previously obscured by said second window is moved to a location within said first window that is not obscured by said second window.

Claim 9: A *computer program element* as claimed in claim 8 *embodied* on a computer *readable medium*.

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