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SOFTWARE PATENTS IN EUROPE: PROMOTING INNOVATION, INVESTMENT & DISCLOSURE

by
Beth Z. Shaw
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Foreword
by
The Honorable Gerald J. Mossinghoff
Oblon, Spivak, McClelland, Maier & Neustadt

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TABLE OF CONTENTS

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FOREWORD

by
The Honorable Gerald J. Mossinghoff[1]
Oblon, Spivak, McClelland, Maier & Neustadt

Patent professionals worldwide are watching with keen interest three developments in Europe:

(1) The creation of a true European Community Patent ("ECP"), now scheduled to come into being in 2010;[2]

(2) The actual implementation in practice by the EU member states of the European Biotechnology Patent Directive, which in theory at least, came into effect in July 2000;[3] and

(3) The European Computer Implemented Inventions Directive ("CII"), now under active consideration.

Each of these initiatives is highly controversial within Europe, with opponents of biotechnology and software patents bringing forth a "parade of horribles" not unlike that described by Chief Justice Berger in his landmark *Chakrabarty* decision,[4] which upheld U.S. biotechnology patents.

This paper by Beth Shaw — a recently graduated student of mine at the George Mason University School of Law and soon-to-be Associate at the Finnegan Henderson law firm — provides a balanced analysis of the current state of play of the CII directive.

The use of computer-implemented inventions — stimulated by the basically unlimited reach of the U.S. patent system — has made the Internet an integral part of our daily lives, to our great economic advantage. As pointed out recently in the *Wall Street Journal*:

> ... the U.S. has substantially outperformed Old Europe in wealth and job creations. The economic growth rate of the European Union nations since 2003 has limped along at about half that of the U.S.[5]

That easily grasped economic fact should provide a proper context for the EU's debate on the CII directive, as outlined in Ms. Shaw's paper.

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[1]Senior Counsel, Oblon, Spivak, McClelland, Maier & Neustadt. A former Assistant Secretary of Commerce and Commissioner of Patents and Trademark during the Reagan Administration, Mr. Mossinghoff is a Distinguished Adjunct Professor of Law at the George Mason University School of Law.

[2]The key issue here is whether the claims of the ECP patent will need to be translated into all 20 of the EU languages, a requirement that to many seems to be unworkable.

[3]Unknown as yet is the scope to be conferred in patents relating to sequences or parts of sequences of genes isolated from the human body.

[4]*Diamond v. Chakrabarty*, 447 U.S. 902 (1978).

[5] WALL ST. J., June 3, 2005, at A10.

SOFTWARE PATENTS IN EUROPE: PROMOTING INNOVATION, INVESTMENT & DISCLOSURE

By

Beth Z. Shaw
Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.

INTRODUCTION

"No Software Patents!"[1] and the "European Software Patent Horror Gallery"[2] are just a few examples of European based web pages created and maintained in opposition to the patenting of software. These web pages contain examples of software patent "horror."[3]

For example, the "European Software Patent Horror Gallery" contains assorted samples of software patents granted in Europe.[4] One example from the European Software Patent Horror Gallery is the "Adobe Patent on Tabbed Palettes" patent, which "covers the idea of adding a third dimension to a menu system by arranging several sets of options behind each other, marked with tabs."[5] The Horror Gallery commentary notes that this invention "is particularly found to be useful in image processing software of Adobe and Macromedia," but states that the invention has been found in other technology,[6] and presumably argues that the invention is not novel or

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[1] *See* NoSoftwarePatents.com, *at* http://www.nosoftwarepatents.com/.

[2] *See* Foundation for a Free Information Infrastructure, *at* http://swpat.ffii.org/index.en.html.

[3] *Id.*

[4] *See The European Software Patent Horror Gallery*, Foundation for a Free Information Infrastructure, *at* http://swpat.ffii.org/patents/samples/index.en.html.

[5] *Id.*

[6] *See id.*

is therefore obvious.

Using anecdotal evidence of the horror that might result from these "bad patents," opponents of software patents argue that innovation in software development will suffer if software patents are granted because software developers will not be able to write code without the threat of infringing an existing patent.[7] These critiques, though earnest and to some degree valid, are not unique to software patents.

The most pressing question in Europe today is whether the European Parliament will adopt the current computer-implemented innovation directive ("CII Directive"). The CII Directive would harmonize European standards on the scope of software patent protection, although it would not grant the same scope of protection afforded to software patents in the United States, because it would not allow for business method patents.

This WORKING PAPER presents a comparative study of software patent protection in Europe and the United States. Part I examines the history of software patent protection in Europe and the United States, the development of case law in the United States, and current patent prosecution guidelines in place at the United States Patent and Trademark Office. Part II evaluates current practices and trends in prosecution and litigation in the United States, and analyzes current software patent protection in Europe. Part III examines the future of European and United States software patent protection, and evaluates the best solutions and practices for software patents, using economic analysis.

This paper concludes that opponents of software patents in Europe fail to comprehend the fundamental benefits of patents in general, and that United States laws and practices may provide useful guidelines as Europe continues to debate the scope of software patent protection and develops

[7]Wesley L. Austin, *Software Patents*, 7 TEX. INTELL. PROP. L.J. 225, 226 (1999).

software patent prosecution guidelines. Further, this paper concludes that the concerns stated by opponents of software patents are misplaced and not supported by empirical evidence or economic theory.

I. BACKGROUND

A. The Debate Over Software Patent Protection

1. *Proponents of Software Patents*

In the United States, the patent system exists to encourage invention, investment, and disclosure. The patent system is designed to encourage this innovation, investment, and disclosure by granting the inventor limited monopoly rights. The purpose of granting a patent is to reward the inventor for his or her invention, and to prevent others from free-riding on the invention and using the economic benefit created by the invention.[8]

Patents create both positive and negative externalities. As discussed above, patents encourage investment, innovation, and disclosure. Yet, allowing even a limited monopoly means that consumers could face higher prices and use less of the monopolized product, creating a social loss.[9] Accordingly, the broader the patent and the longer its life, the greater the cost imposed on some consumers. The United States balances these costs and benefits in the current patent system.

Proponents of software patents argue that improvements in computer-implemented technologies should receive the same level of protection afforded inventions in other arts.[10] Like other patents, proponents argue, disclosure of inventions via the patent system would increase innovation in software. By giving inventors a temporary monopoly

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[8] *See* Robert C. Lind, *Choosing a Way for Europe on Patents for Computer Implemented Inventions*, at 27, *available at* http://w3.cantos.com/05/eicta-504-0arfg/documents/clind_study.pdf.

[9] *Id.* at 28.

[10] *See* Austin, *supra* note 7, at 226 (internal citations omitted).

to exclude others from using their invention, patent protection allows inventors to acquire returns on their investments, and thus provides incentives to innovate, invest, and disclose.[11] Advocates of software patents, therefore, recite the same motivations behind granting patents in other technology for granting software patents.

In Europe, members of the proprietary software industry are concerned that anything short of the current United States standard of software patent protection will leave them at a competitive disadvantage.[12] In February 2002, the European Commission proposed a law for software patents that is more limited than laws in the United States.[13] The European Computer Implemented Inventions Directive ("CII Directive") would replace different regulations in the countries within the European Union, would allow patents only for software applications of a technical nature, and would not allow patents on business methods.[14]

a. The CII Directive

The CII Directive aims to harmonize European law and create legal certainty for the public.[15] Currently, computer programs "as such" are excluded from patentability by Member States' patent laws and the European Patent Convention ("EPC"), but the European Patent Office ("EPO") and national patent offices have granted thousands of patents for computer-implemented inventions.[16] The CII Directive seeks to clarify the

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[11] *See* David S. Evans & Anne Layne-Farrar, *Software Patents and Open Source: The Battle Over Intellectual Property Rights*, 9 VA. J.L. & TECH. 10, 14 (2004).

[12] *Id.* at 12.

[13] *See* Paul Meller, *Europe Offers a Patent Law for Software*, N.Y. TIMES, Feb. 20, 2002, at C7.

[14] *See id.*

[15] *See id.*

[16] *See* PROPOSAL FOR A DIRECTIVE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL ON THE PATENTABILITY OF COMPUTER-IMPLEMENTED INVENTIONS 8, February 2, 2002, [hereinafter PROPOSAL], *available at* http://www.patents4innovation.org/docs/com02-92en.pdf.

limits of what is patentable in computer-implemented inventions.[17]

The current draft of the directive defines a "computer-implemented invention" to mean: "any invention the performance of which involves the use of a computer, computer network or other programmable apparatus, the invention having one or more features which are realised wholly or partly by means of a computer program or computer programs."[18] A "technical contribution" is defined to mean: "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."[19]

Under the current draft, in order to be patentable, a "computer-implemented invention must be: (1) novel, (2) susceptible of industrial application, and (3) involve an "inventive step."[20] To involve an inventive step, a computer-implemented invention must make a "technical contribution."[21] The mere use of a computer does not add a "technical contribution;" inventions that 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

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[17] *Id.* The original February, 2002 draft of the CII Directive notes:

> "To create a level playing field regarding the conditions for protecting computer-implemented inventions between Europe and the U.S., it could have been considered desirable to widen the scope of protection and bring European patent law in this field more in line with the U.S. law. One could have conceived, in particular, to allow for the patentability of computer implemented business methods."

Id.

[18] *See* DIRECTIVE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL ON THE PATENTABILITY OF COMPUTER-IMPLEMENTED INVENTIONS 8, May 24, 2004, [hereinafter DIRECTIVE], *available at* http://www.patents4innovation.org/docs/council_24_may.pdf.

[19] *Id.*

[20] *Id.*

[21] *Id.*

other programmable apparatus in which it is run" are not patentable.[22]

b. Support for the CII Directive

The European Council noted in the CII Directive that most of the directive's support came from organizations representing companies of all sizes.[23] EICTA is one group who supports the CII Directive. EICTA, which describes itself as the voice of the Information and Communications Technology and Consumer Electronics Industries in Europe, comprises 49 multinational corporations—including Apple, Canon, Cisco, Dell, Ericsson, Fujitsu, HP, I.B.M., Intel, Microsoft, Motorola, Nokia and Philips—and 32 national associations from twenty-four European countries.[24] The EICTA has developed a website to explain its position, which states that benefits of the CII Directive include: (1) securing Europe's position as a leading global innovator; (2) protecting innovation; (3) rewarding investment in research and development and accordingly, protecting jobs; (4) promoting interoperability between products; (5) providing a fair patent system across Europe, including a simple and fair means of appeal; and (6) avoiding "re-inventing the wheel," by promoting disclosure.[25]

Although a member of EICTA, I.B.M. recently donated 500 software patents to the open-source community.[26] In doing so, I.B.M. appeared to be siding with a growing number of academics and industry analysts who regard open-source software projects as early evidence of the wide

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[22] *Id.* at 9.

[23] *Id.* ("[S]ubmissions broadly in support of the approach of the consultation paper tended to come from regional or sectoral organisations representing large numbers of companies of all sizes, such as UNICE, the Union of Industrial and Employer's Confederations of Europe, EICTA, the European Information and Communications Technology Industry Association, and the European IT Services Association.").

[24] *See Support for Europe's software patent Directive*, OUTLAW.COM, *at* http://www.outlaw.com/php/page.php?page_id=supportforeurope1100075749&area=news.

[25] *See* http://Patents4Innovation.org.

[26] *See* Steve Lohr, *I.B.M. to Give Free Access to 500 Patents*, N.Y. TIMES, Jan. 11, 2005, at C1; James Watson, *IBM donates 500 software patents to the open source community*, COMPUTING, Jan. 11, 2005, *at* http://www.vnunet.com/news/1160437.

collaboration and innovation made possible by the Internet—but the company shows no indication of slowing its acquisition of patents.[27] At the time of the announcement, I.B.M. also reported that for the twelfth consecutive year, it has been granted more patents than any other company, with 3,248 granted last year alone—1,314 more than its nearest rival, Matsushita Electric Industrial of Japan.[28] The 500 patents are only a small fraction of I.B.M.'s corporate patent portfolio, which contains more than 40,000 patents worldwide and 25,000 in the United States alone.[29] In recent years, software patents have accounted for approximately one-half of these patents granted to I.B.M.[30]

Other United States companies also show no indication of slowing their pursuit of a growing software patent portfolio. For example, Microsoft announced plans to increase its storehouse of intellectual property by filing 50% more patent applications in 2005 than in the previous year.[31] Bill Gates told financial analysts that patents are a very important part of what he terms a "cycle of innovation" that has been responsible for Microsoft's past prosperity and continued corporate health.[32]

Additionally, many European member states support the CII Directive, seeing it as an intermediate position between the scope of United States software patent protection, and no protection at all for software patents. For example, the United Kingdom maintains that it supports the CII Directive, but that it is firmly against any slide towards a "more liberal US-style regime."[33] The United Kingdom's Minister for Science and

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[27]*See* Watson, *supra* note 26.
[28]*See* Watson, *supra* note 26.
[29]Lohr, *supra* note 26, at C1.
[30]*Id.*
[31]Steve Lohr, *Pursuing Growth, Microsoft Steps Up Patent Chase,* N.Y. TIMES, July 30, 2004, at C3.
[32]*Id.*
[33]*UK Rejects Software Patents But Endorses Directive,* OUTLAW.COM (Dec. 12, 2004), *available at*

Innovation recently stated:

> Changes in patent practice in the US in the last five years have caused concern in some areas of the computer industry and the Directive will ensure that Europe continues on its own path which is a balanced approach that both creates a climate for innovation and supports open source software.[34]

The United Kingdom maintains that the CII Directive does not change any current EU law, but rather, "maintains the status quo."[35] Still, the United Kingdom stated that it fears a more liberal regime such as in place in the United States. However, proponents of the directive maintain that the clear language in the CII Directive prohibits business method patents.

2. *Opponents of Software Patents and the CII Directive*

Last summer, the European Parliament, which favors tightly limiting the scope of patent protection for software-related inventions, appeared to be at an impasse with the 25 national governments of the EU.[36] Those countries agreed in May 2004, to a version of the CII Directive.[37] In the last few months, however, some countries have backed away from the agreement.[38]

Originally, opponents of the CII Directive included almost entirely individual supporters of the open-source movement.[39] Advocates of open-source software regard the excessive use of software copyrights and patents

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http://www.outlaw.com/php/page.php?page_id=ukrejectssoftware1103204324&area=news.

[34]*Id.*

[35]*Id.*

[36]Paul Meller, *Plan for Patenting Software Stalls in Europe's Parliament*, N.Y. TIMES, July 30, 2004, at C13.

[37]*Id.*

[38]*Id.*

[39]*See* PROPOSAL, *supra* note 16 and accompanying text (noting that negative responses to the CIID "were dominated by supporters of open source software, whose views ranged from wanting no patents for software at all to the 'official' position of the Eurolinux Alliance which is to oppose patents for software running on general-purpose computers.").

by corporations as a restriction on the efficient exchange of ideas among programmers.[40] These groups argue that the software industry and innovation in software development will suffer if software patents are granted, because software developers cannot write code without the threat of infringing upon an existing patent covering the program design.[41] Thus, the opponents argue, software patents will stifle innovation.

A basic principle of the open-source development model is that important efficiencies in the development process result from making source code freely available to a widespread group of users, who can participate in development and debugging.[42] Further, open-source development and information sharing makes the process of integration with end users' software easier and more efficient.[43] This results in positive externalities for both consumers and developers.

One main hypothesis of European open-source lobbyists is that because high-tech industries, such as semi-conductors, computers, and telecommunications, are industries in which innovation is sequential and highly complementary, these industries have actually become less innovative since software patents became available to them.[44] Some scholars have presented a theoretical model where innovation is both sequential and complementary.[45] They argue that granting patent rights to the first inventor of an invention could result in less innovation, by preventing other innovators from making complementary improvement inventions.[46]

Proponents of software patents respond that in an industry comprised

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[40]Steve Lohr, *Pursuing Growth, Microsoft Steps Up Patent Chase*, N.Y. TIMES, July 30, 2004, at C3.

[41]*See* Austin, *supra* note 7, at 226.

[42]*See* Lind, *supra* note 8, at 67-68.

[43]*Id.*

[44]*Id.* at 37.

[45] *Id.* at 38.

[46]*Id.*

of sequential and complementary technology development, however, there is not often a single invention so fundamental that it cannot be invented around.[47] Thus, it is not clear that an initial patent can deter future developers who may move to alternative technical paths; therefore, the open-source theoretical model does not fit the realities of the software development business.[48] Additionally, many open-source lobbyists who oppose the CII Directive provide little, if any, empirical support for their positions.[49]

a. Poland's Opposition to the CII Directive

Recently, a few countries have joined in the opposition to the CII Directive. Poland has led the strong resistance to adoption of the directive in its current form. Poland objects to the directive because the directive does not contain "clear limits to the patentability of software and business methods."[50] In November 2004, Poland withdrew its support for the CII Directive.[51] Then, in December 2004, the Polish Minister of Science and Information Technology, Wlodzimierz Marcinski, made a special journey to Brussels to demand that the CII Directive be dropped from the agenda of the European Union Council of Ministers ("European Council").[52] On January 25, 2005, Poland successfully blocked the directive for the second time, announcing that it would not support the measure and delaying a vote.[53] The Polish government stated that the wording of the directive is too vague,

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[47] *See id.*

[48] *Id.*

[49] *See id.* at 66 ("I have seen no hard evidence that the Open Source community has been hindered or significantly threatened by the patent system as it now operates in Europe.").

[50] Lucy Sherriff, *Poland Scuppers EU Software Patent Directive*, THE REGISTER (Nov. 18, 2004), *at* http://www.theregister.co.uk/2004/11/18/poland_vote_against/.

[51] *Id.*

[52] *See* Lucy Sherriff, *Poland Halts Software Directive*, THE REGISTER (Dec. 21, 2004), *at* http://www.theregister.co.uk/2004/12/21/patents_dropped.

[53] *Poland Stalls Patent Directive Again*, OUTLAW.COM, Jan. 25, 2005, *at* http://www.out-law.com/php/page.php?page_id=polandstallspatent1106654412.

and would allow for the creation of an extremely liberal regime of software and business method patenting in Europe, similar to the United States laws.[54]

Unlike open-source advocates, Poland's concerns are based on an assessment of the language of CII Directive, instead of a general opposition to patents. The CII Directive was already rewritten once to address these concerns. When the original draft of the directive went to Parliament for its first reading in 2003, members made several significant changes to the text.[55] At that time, the CII Directive was rewritten to limit the scope of what could be patented to software that supported new physical processes, such as steel-making, or a new anti-lock braking system.[56] However, the European Council, under the Irish presidency, voted to reject these changes, and restored the draft to near its original form.[57] Poland argues that the current draft of the CII Directive would allow for direct patentability of computer programs, data structures, and process descriptions — areas the members had earlier voted off the agenda.[58]

The EU Patent Office responds to Poland's concerns by noting that the European Court of Justice is the ultimate authority on what will, or will not, amount to a software patent.[59] The current draft language is sufficiently clear to prevent the patenting of pure software or business methods,[60] because the CII Directive affirms the requirement that a patentable invention must make a technical contribution to the state of the art in a field of technology, and forbids the patenting of business methods or mathematical algorithms that do not produce any technical effects. The

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[54] *Id.*

[55] Lucy Sherriff, *Software Patent Directive Back in Motion*, THE REGISTER, Apr. 25, 2005, *at* http://www.theregister.co.uk/2005/04/25/eu_patents/.

[56] *Id.*

[57] *Id.*

[58] *Id.*

[59] *Id.*

[60] *Id.*

requirement that a patent must make a technical contribution cannot be satisfied by the mere use of a computer program to execute the innovation.[61]

b. Codecision Rules for European Lawmaking

Under the codecision rules for European lawmaking, the European Parliament, European Commission, and the European Council all have to agree on the text of the directive before it can come into force.[62] First, the European Commission drafts a new legislative proposal; it then comes before the European Parliament and the European Council of Ministers.[63] The two institutions discuss and debate the proposal independently, and each may amend it freely.[64] For a proposal to become law, however, the European Council and European Parliament must both approve each other's amendments and agree to the final text in identical terms.[65]

If the two institutions agree after a first reading, the proposal becomes law; otherwise, there is a second reading at each institution, where each considers the other's amendments.[66] The Parliament must conduct the second reading within three months of the European Council delivering its common position, or else the European Council's amendments are deemed accepted.[67] If the two institutions are unable to reach agreement after the second reading, a conciliation committee is set up with an equal number of members from the European Parliament and the European Council; this committee attempts to negotiate a compromise text which must then be approved by both institutions.[68] Both the European Parliament and the

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[61] *See* Lind, *supra* note 8, at 8.

[62] *See Codecision Procedure*, WIKIPEDIA DICTIONARY, *at* http://en.wikipedia.org/wiki/Codecision_procedure.

[63] *Id.*

[64] *Id.*

[65] *Id.*

[66] *Id.*

[67] *Id.* Parliament can extend the three month time period if it chooses. *Id.*

[68] *Id.*

European Council have the power to reject a proposal either at the second reading, or following conciliation, causing the proposal to fail.[69]

After Poland's second successful delay, the European Council gave its support to the CII Directive.[70] The directive then went back to the European Parliament for a second reading.[71] As it stands, amendments to the directive have been tabled and JURI (the group responsible for proposing any amendments to the directive) has met to discuss the changes.[72] A vote on the directive has been scheduled for June 20, 2005 before it moves to a plenary vote in Strasbourg, in July 2005.[73]

At first, supporters of the directive worried that Poland is attempting to take the directive back to a first reading in the European Parliament—a process that it says could take up to three years.[74] Other supporters of the CII Directive now worry that the European Parliament could simply adopt amendments that it knows the European Council will not accept, meaning that the directive will ultimately fail.[75] The European Parliament has indeed indicated that it wants the directive redrafted,[76] but it is unclear how they will choose to amend the directive this time. Although passing amendments during a second reading is more difficult because it requires an absolute majority vote, according to the EU Policy Director at the Political Intelligence Consultancy, it happens fairly often.[77]

At the moment, opponents have successfully delayed the passage of the CII Directive for at least a year. Some of the open-source advocates who

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[69] *Id.*

[70] *See EU Governments Back Contentious Software Patent Bill*, SAN JOSE MERCURY NEWS, Mar. 7, 2005.

[71] *See* Sherriff, *supra* note 50.

[72] *Id.*

[73] *Id.*

[74] *Id.*

[75] *Id.*

[76] *Id.*

[77] *Id.*

oppose the CII Directive appear to misunderstand current EU law regarding the grant of software patents—they believe that patenting software itself will discourage innovation and disclosure. Poland's main argument—that the CII Directive is too vague and would allow for business method patents—at least considers the actual practices in place in Europe, and the language of the directive. As the EICTA notes, however, the EPO and national patent offices have been patenting high-tech inventions for the past thirty years.[78] What the CII Directive does is codify and harmonize national legislation, "which in real terms means that if somebody invents a product, they do not have to deal with [twenty-five] different laws governing how that product's patent can be enforced."[79]

B. A Brief History of United States Litigation of Software Patents

Since the 1970's, efforts to patent software have generated litigation in the United States, revealing splits among the federal courts, and eventually requiring more than one Supreme Court decision on the legality and scope of software patents.

The first significant software patent decision came in 1972 when the Supreme Court decided *Gottschalk v. Benson*.[80] The case stemmed from an application for a patent on an invention described as related "to the processing of data by program and more particularly to the programmed conversion of 'numerical information' in general-purpose digital

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[78] *See* Http://Patents4Innovation.org (statement of Mark MacGann, Spokesman for the European technology industry).

[79] *Id.*

[80] 409 U.S. 63, 64 (1972) (holding computer program involving method of converting binary-coded-decimal numerals into pure binary numerals, a mathematical formula without substantial practical application except in connection with digital computer, was not a patentable process).

computers."[81] The applicants claimed "a method for converting binary-coded decimal (BCD) numerals into pure binary numerals."[82] The claims were not limited to any particular art, apparatus, or machinery, or to any specific end use, but instead covered "any use of the claimed method in a general-purpose digital computer of any type."[83] Several claims were rejected by the Patent Office and then sustained by the Court of Customs and Patent Appeals, and the case was subsequently appealed to the Supreme Court.[84]

The Court attempted to decide "whether the method described and claimed is a 'process' within the meaning of the Patent Act."[85] The Court noted that the procedures set forth in the claims were for an "algorithm; that is to say, they are a generalized formulation for programs to solve mathematical problems of converting one form of numerical representation to another;" the Court ultimately held that a mathematical algorithm itself is not patentable.[86] The Court noted, however, that perhaps Congress should extend patent law to cover these types of claimed programs.[87] Six years later, in *Parker v. Flook*, the Court refused to overrule or expand *Gottschalk* without a clear directive from Congress.[88]

In 1981, in *Diamond v. Diehr*, the Court affirmed the principle that an invention could not be denied a patent only because its claims covered a

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[81] *Id.*
[82] *Id.*
[83] *Id.*
[84] *Id.*
[85] *Id.*
[86] *Id.* at 73.
[87] *Id.*
[88] *See Parker v. Flook*, 437 U.S. 584, 596 (1978) (holding the identification of postsolution applications of the formula did not make the method eligible for patent protection, and (2) the application simply provided a new and presumably better method for calculating alarm limit values, in which the only novel feature was the mathematical formula or algorithm, and thus did not describe patentable subject matter).

mathematical formula; still, the Court held that mathematical algorithms were not patentable subject matter if they covered merely abstract ideas.[89] The Court therefore mandated a test that examined the invention as a whole.[90] In *Diehr*, the Court stated that certain types of mathematical subject matter, standing alone, represent purely abstract ideas until they are reduced to some type of practical application (i.e., "a useful, concrete and tangible result.").[91] Thus, two exceptions remained after *Diehr*: those relating to mathematical algorithms and, questionably, business methods.[92]

Meanwhile, the Court of Customs and Patent Appeals had created what has been described as "the Freeman-Walter-Abele test."[93] The test was subsequently adopted by the United States Court of Appeals for the Federal Circuit ("Federal Circuit"), to separate and identify unpatentable mathematical algorithms from patentable subject matter.[94] The test requires analyzing the claim "to determine whether a mathematical algorithm is directly or indirectly recited." If a mathematical algorithm is found, the claim as a whole is further analyzed to determine whether the algorithm is "applied in any manner to physical elements or process steps," and, if it is, it "passes muster under § 101."[95]

Finally, in 1998, in *State Street Bank & Trust Company v. Signature Financial Group*, the Federal Circuit eliminated both exceptions left over from *Diehl*.[96] The court noted that after *Diehr* and *Chakrabarty*, "the

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[89]*See Diamond v. Diehr*, 450 U.S. 175 (1981).

[90]*Id.*

[91]*Id.*

[92]Michael Guntersdorfer, *Software Patent Law: United States And Europe Compared*, 2003 DUKE L. & TECH. REV. 6, 12 (2003).

[93]*See In re Freeman*, 573 F.2d 1237, 197 U.S.P.Q. 464 (C.C.P.A. 1978) *as modified by In re Walter*, 618 F.2d 758, 205 U.S.P.Q. 397 (C.C.P.A. 1980).

[94]*State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373-74 (Fed. Cir. 1998).

[95]*Id.* (citing *In re Pardo*, 684 F.2d 912, 915 (C.C.P.A. 1982) (citing *In re Abele*, 684 F.2d 902, 214 U.S.P.Q. 682 (C.C.P.A. 1982))).

[96]*Id.*

Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter."[97] Thus, the court held the mathematical algorithm test misleading, and determined the business method exception had never existed: prior business method patents had always been refused on other grounds.[98] Therefore, instead of focusing on the four categories of subject matter (process, machine, manufacture, or composition of matter), a court should determine an invention's "practical utility," and the invention must also satisfy the tests of novelty and non-obviousness.[99]

In 1999, the Federal Circuit limited the holding of *State Street* by returning to the prior holding of *In re Alappat*: algorithms are patentable because "a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."[100] This holding is more limited than *State Street's* broad holding that algorithms were patentable as long as their application "produced a useful, concrete, and tangible result."[101]

Recently, some commentators have reported an increase in software patent litigation in the United States.[102] There have been no systematic empirical studies of whether this litigation involves large companies as

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[97] *State Street*, 149 F.3d at 1374.

[98] *Id.*

[99] *Id.; see also* Guntersdorfer, *supra* note 92, at 13.

[100] *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1348-49 (Fed. Cir. 1999) (quoting *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994)); *see also* Guntersdorfer, *supra* note 92, at 14.

[101] Guntersdorfer, *supra* note 92, at 14.

[102] *See* Steven Andersen, *IP Law Comes of Age: IP Enters the No-Holds-Barred World of Complex Business Litigation*, CORP. LEGAL TIMES, Sept. 2004, at 48, 53 (finding a "spike" in the number of software patent cases); GRAHAM, STUART J.H., AND DAVID C. MOWERY, "Intellectual Property Protection in the U.S. Software Industry," in WESLEY M. COHEN AND STEPHEN A. MERRILL, EDS., PATENTS IN THE KNOWLEDGE-BASED ECONOMY, NATIONAL RESEARCH COUNCIL, WASHINGTON, D.C.: NATIONAL ACADEMIES PRESS 219-58 (2003) (noting that software patents were more likely to be litigated than patents in general, and that this is especially trued for software patents granted from continuation applications).

plaintiffs, suing independent inventors, or some other combination. Without more evidence, it is unclear that more litigation itself supports the dire predictions of critics of software patents. Because the software patent system is still evolving in the United States, it is predictable that parties will litigate to determine the scope of their rights, and to enforce their patents. The effects of litigation are discussed in more detail, *infra* Part III.

C. European Software Patent Protection

1. *Development of European Software Patent Law*

The current European Patent Convention ("EPC") defines patentable inventions in Europe. Section 52 of the EPC states: "European patents shall be granted for any inventions susceptible of industrial application, which are new and which involve an inventive step."[103] Thus, EPC Section 52 requires: (1) industrial applicability, (2) novelty and (3) an inventive step for a patent to be granted.[104]

The EPC requirements parallel the current laws in the United States in many ways. First, the "industrial applicability" requirement is similar to the usefulness requirement of 35 U.S.C. § 101.[105] Second, novelty is defined in EPC section 54 as "not form[ing] a part of the state of the art,"[106] which parallels the United States novelty requirement found in 25 U.S.C. § 102.[107] Finally, the "inventive step" requirement is parallel to the requirement in United States law of non-obviousness, as evidenced by EPC section 56, which states that an "invention shall be considered as involving an inventive step if . . . it is not obvious to a person skilled in the art."[108] However, software does not automatically qualify, and instead, an invention must be

[103]*See* Guntersdorfer, *supra* note 92 at 14 (citing E.P.C. § 52(3)).
[104]*Id.*
[105]*Id.*; *see also* 35 U.S.C. § 101.
[106]Guntersdorfer, *supra* note 92 at 6. (citing E.P.C. § 54).
[107]*See* 35 U.S.C. § 102.
[108]Guntersdorfer, *supra* note 92 at 14.

of a "technical" nature in order to be patentable.[109]

Clause 2 of EPC section 52 lists what particular types of inventions are viewed as "non-technical," and are therefore excluded from patentability: "(a) discoveries, scientific theories and mathematical methods; (b) aesthetic creations; (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers; (d) presentation of information."[110]

However, clause 3 of EPC section 52 limits that list of exclusions by stating that the provisions in clause 2 "shall exclude patentability of the subject-matter or activities referred to in that provision only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such."[111]

In Europe, the limits of the clause 3 requirement led to cases resulting in rules similar to the result in *Diehr*.[112] For example, in one case, the Technical Board of Appeal of the European Patent Office ("Technical Board") held that even if the idea underlying an invention resides on matter excluded under section 52 clause 2, the invention might still be patentable if it is directed at a technical process, as long as no protection is sought for the excluded matter "as such."[113] The Technical Board relied on clause 3, noting that clause 2 excludes patentability of certain subject-matter or activities "only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such."[114]

The case began in 1979, when Vicom Systems filed an application for a

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[109] *Id.*

[110] *See* E.P.C. § 52 (2).

[111] *See* Guntersdorfer, *supra* note 92 at 17 (citing E.P.C. § 52(3)).

[112] *Id.*

[113] *Id.*

[114] *See In re Vicom Sys., Inc.*, 1987 O.J.E.P.O. 14, 19 (Tech. Bd. App. 1986), *available at* http://legal.european-patent-office.org/dg3/biblio/t840208ep1.html.

method and apparatus "for improved digital image processing."[115] Vicom had filed for a corresponding United States patent in 1978, which was granted in 1982.[116] The Examining Division of the European Patent Office, however, rejected the European application.[117] The Technical Board reasoned that there was "little doubt that any processing operation on an electric signal can be described in mathematical term," and that "there is no basis in the E.P.C. for treating digital filters differently from analogue ones," which are patentable.[118]

Commentators have noted further similarities to United States holdings in European law.[119] For example, *Diehr's* requirement of looking at the "invention as a whole" was articulated by the Technical Board in the European case *Siemens A.G. v. Koch & Sterzel GmbH & Co.*[120] The Technical Board held that it is "unnecessary to weigh up the technical and non-technical features" and that "if the invention . . . uses technical means, its patentability is not ruled out."[121]

Similarly, the decision in *Alappat*—that computer programs are patentable because they limit a general purpose computer to a specific purpose—is reflected in the European case *In re Dai Nippon Insatsu*, where the Technical Board held that "the units of the claimed [specifically designed] apparatus are to be regarded as differing from 'conventional' ones" and that "such programs [i.e. programs that limit the conventional apparatus to specific tasks] are . . . to be regarded as tools."[122]

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[115]*See* Guntersdorfer, *supra* note 92, at 17 (citing European Patent Application No. 0,005,954 (filed May 22, 1979), *available at* Http://l2.espacenet.com/espacenet/viewer?N=EP0005954&CY=ep&LG=en&DB=EPD).

[116]*Id.*

[117]*Id.* at 18.

[118]*Id.* (citing *Vicom*, 1987 O.J.E.P.O. at 14).

[119]*Id.*

[120]*Id.*

[121]*Id.* at 19.

[122]*Id.*

The closest Europe ever came to *State Street* was in *In re Sohei*, when the Technical Board held that an otherwise patentable computer program would not lose its patentability simply because additional features fall within subject matter listed in the exclusions of §52(2).[123] The invention in *In re Sohei* concerned an inventory management system, which arguably fell within the business method exception.[124] However, several years later, the Technical Board reaffirmed that business methods as such are excluded from patentability and that the mere addition of a technical feature to an otherwise non-technical method did not confer technical character upon the invention.[125] Although a technical invention is patentable even with a non-technical feature, a non-technical invention does become patentable via inclusion of a technical feature.[126]

On the whole, therefore, the legal requirements for patenting software are similar in many ways in the United States and Europe.[127] The actual patentability of software is not at issue anymore in either the United States or Europe. Instead, the current focus is on the scope and context of patents for computer programs. Europe insists that its technical contribution requirement blocks patents for inventions that lack at least some physical effect, while the United States has abandoned the requirement that patentable inventions must exist in the physical world in some way or another.[128]

2. Current European Software Patent Law

The EU is currently in the midst of a debate over harmonizing the treatment of computer-implemented inventions. The European and

[123] *Id.*
[124] *Id.*
[125] *Id.*
[126] *Id.*
[127] *See* Guntersdorfer, *supra* note 92, at 11.
[128] *See id.* at 21.

national patent systems specifically state computer-implemented inventions are not patentable.[129] However, various EU member states have interpreted the laws differently, resulting in, by some estimates, "tens of thousands" of granted European software patents.[130] Still, the European software patent dispute, like current American one, does not center on whether to patent software, but instead on how to measure the scope of software patent protection.

D. The European Debate over the Computer Implemented Inventions Directive

The CII Directive is aimed at clarifying the patent protection for software in Europe. If the CII Directive is accepted, Europe will adopt the uniform definition of a computer implemented invention as: "any invention the performance of which involves the use of a computer, computer-network or other programmable apparatus and having one or more prima facie novel features which are realized wholly or partly by means of a computer program or computer programs."[131]

The purpose behind the CII Directive mirrors the motivations behind the United States patent system. The directive's stated purpose is to standardize computer implemented invention requirements for patentability, because:

> Patents act as an incentive to invest the necessary time and capital and [they] stimulate employment. Society at large also reaps benefits from the disclosure of the invention, which brings about technological progress upon which other

[129] *See* Evans & Layne-Farrar, *supra* note 11, at 14.

[130] *Id.; see also* Foundation for a Free Information Infrastructure, *at* http://swpat.ffii.org/index.en.html (presenting statistics on software patents granted in Europe).

[131] *See, e.g.*, DIRECTIVE, *supra* note 18; *Promote the Progress*, *at* http://promotetheprogress.com/archives/2004/11/polish_pull_sup.html.

inventors can build.[132]

This motivation is analogous to the United States' goal of promoting invention, investment, and disclosure.

Further, the CII Directive aims to standardize the law and create certainty for inventors, investors, and the general public.[133] For example, computer programs "as such" are excluded from patentability by member states' patent laws and the EPC, but the EPO and national patent offices have already granted thousands of patents for computer-implemented inventions.[134] Thus, it is apparent that the current laws are not creating certainty for patent owners or open-source developers in Europe.

The main difference between the CII Directive and United States law is that Europe will require a "technical contribution" provided by the invention.[135] Thus, the CII Directive, in practice, would be more restrictive than current United States law, which allows business method patents. If the CII Directive is adopted, a patent could only be granted in Europe for an invention that is new, non-obvious, and makes a "technical contribution;" a patent cannot be granted for "pure software."[136]

On March 7, 2005, the European Council adopted the CII Directive, after rejecting demands by Poland, Denmark, Portgual, and other groups requesting the European Council to reject the CII Directive or revise it from scratch.[137] The European Council has warned that it will not redraft the CII

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[132] *See* PROPOSAL, *supra* note 16 and accompanying text.

[133] *See id.*

[134] *Id.*

[135] *Id. (*"The difference between the U.S. and Europe and between the U.S. and Japan is that in Europe there has to be a *technical contribution* provided by the invention.").

[136] *See id.*

[137] *See Software Patent Directive Adopted*, ZDNET.COM, *at* http://news.zdnet.co.uk/0,39020330,39190497,00.htm.

Directive if the European Parliament refuses to pass the current proposal.[138] As it stands, the CII Directive will return to the European Parliament for a vote on adoption or rejection, which will likely occur in July 2005.[139] If the European Parliament adopts the CII Directive, software patents would be uniformly regulated in EU member states.

As discussed above, Poland objects to the CII Directive. Denmark and Portugal have joined Poland's opposition, along with other opponents of software patents. One driving force behind this opposition is the fear that large corporations will benefit from the CII Directive, while small companies and independent inventors will suffer.[140] Poland argues that fear of litigation will threaten innovation by small companies or independent inventors, who cannot afford to defend against high-stakes suits.[141] Further, open-source advocates argue that the CII Directive will seriously damage the open-source movement.

Supporters of the CII Directive respond to these objections by noting that without consistent protection, small entities are prey to companies copying their technology without payment.[142] The patent system would prevent this sort of free-riding and create a positive externality for small entities and independent inventors. Further, the "overwhelming majority" of patent disputes in the EU involve small entities seeking to defend their inventions; the CII Directive will make this type of controversy a more simple and effective process.[143] In response to open-source advocates, proponents of the directive note that open-source software and patents have co-existed for many years without problems, and the new directive does

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[138] *See E.U. Commission Gives Parliament Ultimatum On Patent Overhaul*, IP LAW BULLETIN, Mar. 8, 2005, *at* http://www.iplawbulletin.com/cgi-bin/absolutenm/anmviewer.asp?a=3118&z=18.

[139] *Id.; see also supra* note 2.

[140] *See* Patents4Innovation, *at* http://www.patents4innovation.org/.

[141] *Id.*

[142] *See id.*

[143] *Id.*

nothing to change this.[144]

II. UNITED STATES PROSECUTION PRACTICES COMPARED TO EUROPE'S

A. Prosecution Practice in the United States Patent and Trademark Office Compared to the European Patent Office

The position of the United States Patent and Trademark Office ("USPTO") regarding software patents is described in detail in the Manual of Patent Examining Procedure ("MPEP").[145] The USPTO's position essentially tracks the law from the United States Court of Appeals for the Federal Circuit ("Federal Circuit"). For computer-related inventions, the "invention as a whole must accomplish a practical application."[146] Specifically, the invention must produce a "useful, concrete and tangible result."[147]

Apart from the utility requirement of 35 U.S.C. § 101, usefulness under the patent eligibility standard requires "significant functionality" to satisfy the useful result aspect of the practical application requirement.[148] "Merely claiming nonfunctional descriptive material stored in a computer-readable medium" is not sufficient to make the invention entitled to

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[144]*Id.*

[145]*See* Patentable Subject Matter—Computer-Related Invention, *M.P.E.P. § 2106*. It is important to note that:

> These Guidelines do not constitute substantive rulemaking and hence do not have the force and effect of law. These Guidelines have been designed to assist Office personnel in analyzing claimed subject matter for compliance with substantive law. Rejections will be based upon the substantive law and it is these rejections which are appealable. Consequently, any failure by Office personnel to follow the Guidelines is neither appealable nor petitionable.

Id.

[146]*See id.*

[147]*Id.* (citing *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601-02).

[148]*Id.* (citing *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036.).

patenting.[149]

The MPEP provides several examples. First, "a claim directed to a word processing file stored on a disk" could satisfy the utility requirement of 35 U.S.C. § 101 because the information stored may have some "real world" value, but the sheer fact that the claim could satisfy the section 101's utility requirement "does not mean that a useful result is achieved under the practical application requirement."[150] Instead, the claimed invention as a whole must produce a "useful, concrete and tangible" result to have a practical application.[151]

Further, a process that consists solely of "the manipulation of an abstract idea is not concrete or tangible."[152] The MPEP instructs that patent examiners have the burden to establish a *prima facie* case that the claimed invention as a whole is directed to solely an abstract idea or to manipulation of abstract ideas or does not produce a useful result.[153] The claim should only be rejected under 35 U.S.C. § 101 when it is devoid of any limitation to a practical application in the technological arts.[154] Further, when a section 101 rejection is made, an examiner is required to expressly state how the language of the claims has been interpreted to support the rejection.[155]

It is worth noting that the MPEP emphasizes that the requirements for sufficient disclosure of inventions in computer programming are the "*same as for all inventions being patented.*"[156] The MPEP continues to describe specific enablement and written description requirements, but the essential requirements are the same as for other types of technology being

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[149] *Id.*

[150] *Id.*

[151] *Id.*

[152] *Id.* (citing *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994) and *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1459).

[153] *Id.*

[154] *Id.*

[155] *Id.*

[156] *Id.* (emphasis added).

patented.

B. Statistics: Software Patents Applied for and Granted Per Year in the United States

Statistics are not readily available for software patents alone, because patents and applications for patents are classified according to current categorizations available at the USPTO. Thus, examining patents granted with the electrical category as the primary classification may prove the best model for computer-related inventions.

For patents granted and compiled by year of application in the USPTO, the most recently available general statistics show that based on the primary classification in the electrical category, the numbers have remained steady between 1995 and 1999.[157] For example, in 1995, 16,816 patents were granted by year of application, whereas in 1990, 10,855 were granted.[158]

Yet, if viewed by year of grant, the figures for electrical patents are remarkably increasing for small entities or independent inventors, classified as "other organizations"—groups that are too small to earn their own classification in the report. For example, in 1995, 8,645 patents were granted to small entities, with their primary classification as electrical.[159] In contrast, in 2001, 19,312 patents were granted with the primary classification as electrical.[160] The table below illustrates the PTO trend in grants of patents in the electrical classification from 1995 through 2001.

Year of Grant	Electrical Patents
1995	8,645
1996	9,674

[157] *See USPTO Technology Assessment and Forecast Report, Electrical Classes*, tbl. B-25, *available at* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/stelec.pdf.

[158] *Id.*

[159] *Id.*

[160] *Id.*

1997	9,568
1998	14,281
1999	14,937
2000	16,485
2001	19,312

Thus, statistics from the USPTO indicate that more electrical patents are being granted in recent years to small entities. This increase can most likely be attributed to the increase in applications for software and computer-related patents in the USPTO. Therefore, although patents granted to large corporations are increasing,[161] grants to small entities are also increasing.

III. THE FUTURE OF EUROPEAN AND UNITED STATES PATENT PROTECTION FOR SOFTWARE

A. Recent Litigation and Trends in the United States

Recent litigation of software patents in the United States has focused on specific claims in patents, rather than the fundamental patentability of software. Because the standards for software patents have been in existence for several years, it appears than software developers have adapted to the rule in place and modified their investments accordingly.

Recently, some commentators have reported an increase in software patent litigation in the United States.[162] Many large companies acknowledge

[161] *See* note 26 and accompanying text.

[162] *See* Steven Andersen, *IP Law Comes of Age: IP Enters the No-Holds-Barred World of Complex Business Litigation*, CORP. LEGAL TIMES, Sept. 2004, at 48-53 (finding a "spike" in the number of software patent cases); GRAHAM, STUART J.H., AND DAVID C. MOWERY, INTELLECTUAL PROPERTY PROTECTION IN THE U.S. SOFTWARE INDUSTRY (Wesley M. Cohen and Stephen A. Merrill, eds.); PATENTS IN THE KNOWLEDGE-BASED ECONOMY, NATIONAL RESEARCH COUNCIL, WASHINGTON, D.C. (NATIONAL ACADEMIES PRESS 219-58 2003) (finding that software patents are more likely to be litigated than patents in general, and that this is especially the case for continued software patents).

that they maintain portfolios of software patents for defensive purposes.[163] Perhaps the increased software litigation is due to the lack of available prior art in examination of software patents.

A patent applicant has a duty to disclose all known prior art that materially bears on the question of patentability.[164] If the applicant knows of prior art and does not disclose it, the applicant commits inequitable conduct, and the patent can later be held unenforceable.[165] Many current software patent cases involve allegations of inequitable conduct. A recent search on Westlaw showed that about 27% of software patent cases involved allegations of inequitable conduct.[166] Although this search is only a preliminary investigation, it reveals that almost one-third of current software patent litigation involves allegations of fraud or inequitable conduct before the USPTO. This result is not surprising, given the dearth of available prior art and the prevailing belief that too many "bad" patents are granted because of this lack of available prior art.

B. The Future of European Law: The Development of Software Patent Protection in Europe from an

[163] *See* Larry Greenemeier, *Novell Warns Against Patent Suits*, INFORMATION WEEK, Oct. 12, 2004, *at* http://informationweek.com/story/showArticle.jhtml?articleID=49901146.

[164] 37 C.F.R. § 1.156 (2000).

[165] *See* Kimberly A. Moore, *Xenophobia In American Courts*, 97 NW. U. L. REV. 1497, 1550 (2003) [hereinafter *Xenophobia*].

[166] The author first searched on Westlaw in the "ALLFEDS" database, which contains all federal cases, for: (software OR computer) /s "patent". This search resulted in 1491 hits. Next, the search was restricted to search for: (software OR computer) /s "patent" and ("inequitable-conduct" OR fraud), which resulted in 400 hits; calculating 400/1491 = 26.8%.

Economic Perspective

1. Europe Should Begin to Recognize the Same Requirements for Patentability of Software as for Other Technology

The concerns of software opponents, including Poland, are not unique to the software patent system. As discussed *supra*, Part II.A.1, in the United States, the requirements to patent software are the same as for other technology. The USPTO's Manual of Patent Examining Procedure emphasizes that the requirements for adequate disclosure of inventions in computer programming are the "*same as for all inventions being patented*."[167] Thus, in the United States, the requirements for a patent to be granted, specifically the novelty and non-obviousness requirements, effectively address the opponents of software patents.[168]

Further, as discussed above, in the United States a patent applicant has a duty to disclose all known prior art that materially bears on the question of patentability.[169] If the applicant knows of prior art and does not disclose it, the applicant commits inequitable conduct, and the patent can later be held unenforceable.[170] Indeed, all related patents could be held unenforceable under the doctrine of unclean hands.[171] Accordingly, "inequitable conduct is a deadly sin."[172] Just as for other types of inventions, if applicants procure "bad" software patents by failing to disclose available prior art, then the applicant's patents can later be held unenforceable.

Consequently, the uniform disclosure requirements and the punishment available for inequitable conduct should sufficiently prevent abuse of the patent system by those seeking patent protection for software.

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[167] *See* M.P.E.P. § 2106 (emphasis added).
[168] *See* Austin, *supra* note 7, at 226.
[169] 37 C.F.R. § 1.156 (2000).
[170] *See* Moore, *Xenophobia, supra* note 165, at 156.
[171] *Id.* at n.137.
[172] *Id.*

If not, any abuses that occur will be cured through reexamination or litigation. Critics of software patents who argue that too many bad patents will result from allowing the patenting of software conveniently ignore the similarities in examination procedure and litigation for other types of patentable technology.

2. Empirical Evidence Indicates that Opponents' Concerns About Software Patents are Unfounded

Empirical evidence suggests that many criticisms of software patents are unsubstantiated.[173] The few available academically published empirical studies of software patents are not as discouraging as some anecdotal evidence (such as the "Software Patent Horror Gallery") suggests.[174]

For example, one recent study compared general patents with Internet business method patents, using the number of prior art references listed in a patent as a measure of the rigor of the prior art search.[175] This study found that of the patents issued between 1996 and 1998, business method patents and general patents had statistically insignificant differences in prior art references listed on the face of the issued patent.[176]

However, the study did conclude that the Internet business method patents contained more references to non-patent prior art than general patents.[177] The study noted that within the subcategory of Internet software technique patents, the software patents contained more references to non-patent prior art than did the general patents.[178] Opponents of software

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[173]*See* Evans & Layne-Farrar, *supra* note 11, at 35.

[174]*See id.*

[175]*See* John Allison & Emerson Tiller, *Internet Business Method Patents*, PATENTS IN THE KNOWLEDGE-BASED ECONOMY 279 (Wesley M. Cohen & Stephen A. Merril eds., 2003).

[176]*Id.*

[177]*Id.*

[178]*Id.*

patents might look to such evidence as support for their critiques of software patents. These opponents would likely argue that the lack of patent prior art available proves that software patents are not being thoroughly examined at the United States Patent and Trademark Office.

Yet, because software patents have not been issued in the United States for as long a period of time as other technological arts, this result seems reasonable because there are fewer software patents in existence that are available as patented prior art references. Therefore, perhaps the additional non-patent prior art references were cited out of necessity, substituting for the non-existent patent references.[179]

The increasing grant of software patents supports the theory that increasing the amount of software patents examined will also, by definition, increase the supply of available prior art. With more applications for software patents, the patent offices in the United States and Europe will have more prior art—both patent and non-patent—readily available to search.

3. Increasing the Supply of Software Patents Would Decrease Bad Software Patents in Europe

If the European Parliament adopts the CII Directive, software patent protection standards in Europe should become uniform. For software patent protection in Europe to develop with predictability for applicants and for the European public, the European Council and the European Parliament should vote to accept the CII Directive and continue to harmonize the scope of software patent protection, even though this protection would not be entirely uniform with United States law.

Interestingly, it appears that the current EPC section 52 already tracks

[179] *See id.*

many aspects of United States patent law.[180] Further, the development of case law from the Technical Board is similar to the legal path of software development in United States courts in the late 1970's through the 1990's. The current legal differences remain because Europe persists in its position that its technicity requirement bars patents for computer-related inventions without at least some physical effect, whereas the United States has abandoned the requirement that patentable inventions must somehow exist in the physical world.[181]

Still, as preliminary empirical research has shown, the "horror" of software patents has not proven to be truly horrific, or in any sense less than predictable. If the CII Directive is adopted to create uniform patent protection in Europe, there exists the possibility that initially some "bad patents" will be granted—a fear of many opponents of software patents. However, as the prior art supply builds over time, the prosecution system will eliminate bad patents to the advantage of the public as a whole.

The current lack of prior art makes it difficult for patent examiners to determine originality or obviousness, resulting in too many "bad" software patents initially.[182] With an additional cache of prior art available due to the increase in software patent applications, however, fewer "bad" patents will issue. Further, because a patent applicant has a duty to disclose all known prior art that materially bears on the question of patentability, if an applicant knows of prior art and does not disclose it, the applicant commits inequitable conduct, and the patent can later be held unenforceable.[183]

C. A Prediction about Software Patent Litigation in

[180] *See supra* notes 103-09 and accompanying text.
[181] *See* Guntersdorfer, *supra* note 92, at 22.
[182] *See* Evans and Layne-Farrar, *supra* note 11, at 25.
[183] *See* Moore, *Xenophobia*, *supra* note 165, at 1550.

Europe after Adoption of the CII Directive, According to Economic Theory

Even more important than the elimination of "bad" patents from the patent pool, with uniform rules in Europe, parties will incorporate their decisions about software development into their strategic decision regarding whether to apply for a patent and disclose their invention, keep their innovation as a trade secret, or enforce a software patent through litigation or settlement. In other words, the CII Directive would clearly delineate the scope of software patent rights, and parties would adapt to the system, just as they have adapted to the patent system for other technologies, and just as parties in the United States have adapted to the laws governing software patent protection in this country.

1. Expectations Theory Applied to Software Patent Litigation

Expectations theory proposes that disputes that reach the trial stage represent a biased sample of all disputes.[184] One basic conclusion of most litigation models is that parties litigate disputes to trial only when they have different expectations of the outcome.[185] It is more likely that a case will proceed to trial when the parties' expectations of litigation outcomes differ in either the amount of damages or the likelihood of recovery.[186]

Expectations theory predicts that objectively strong and weak cases do not reach trial.[187] In cases that are recognized by both the plaintiffs and defendants as being strong for the plaintiffs, the defendants should settle

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[184]*See* Theodore Eisenberg, *Litigation Models and Trial Outcomes in Civil Rights and Prisoner Cases*, 77 GEO. L.J. 1567, 1568 (1989) (describing the "expectations theory," suggesting that tried cases might not reflect the pool of all disputes).

[185]*Id.* (citing Eisenberg & Schwab, *The Reality of Constitutional Tort Litigation*, 72 CORNELL L. REV. 641 (1987)).

[186]*Id.*

[187]*Id.*

with the plaintiffs.[188] On the other hand, if plaintiffs have objectively "weak cases," the plaintiffs will not sue in the first place, or will abandon the suit once filed rather than incur litigation costs in a losing effort; parties litigate to trial only cases in some gray middle area.[189] The selection effect, therefore, predicts that disputes that actually go to trial represent a "skewed subset" of all disputes.[190]

One central prediction of other litigation models is that plaintiffs and defendants will have a similar expected success rate at trial—50%.[191] Applying expectations theory, criticisms of the legal system of software patents in the United States or Europe, based on studies of subsets of disputes, might not be as conclusive as they seem. For example, expectations theory suggests that antitrust cases that reach trial may not accurately reflect the characteristics of an underlying antitrust dispute.[192] Similarly, software patent cases that reach trial probably do not accurately reflect the characteristics of the underlying software patent dispute.

Some critics of the CII Directive fear that with increased protection for software patents in Europe, most litigation will be brought by large corporations acquiring patent portfolios purely to block the rights of small, individual software developers. This fear of litigation, the argument goes, would threaten software innovation.

Yet, as illustrated by the increasing acquisition of patents by small entities in the United States, it is not at all clear that this perceived threat of suit will bear out in Europe in the way that critics predict. First, critics who rely on examples of large companies suing small inventors might be relying on purely anecdotal evidence. Second, even if the current system does

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[188] *Id.*

[189] *See id.*

[190] *Id.*

[191] *See* William Baxter, THE POLITICAL ECONOMY OF ANTITRUST 3 (R. Tolison ed. 1980).

[192] *Id.*

reflect the fears of the open-source movement, it could be because software patent cases that reach trial do not accurately reflect the characteristics of the underlying software patent disputes.

Further, in the cases that do reach trial, it is quite likely that juries will favor small entities or independent inventors. Several studies show that juries tend to side with independent inventors,[193] perhaps because jurors relate better to individuals, or possibly for wealth redistribution reasons.[194] Based on this evidence, it may be that large corporations are the ones who should worry about increasing software patent protection in Europe.

Still, larger corporations might have an easier time handling the costs of litigation, which can range between $1.5 and 2.5 million dollars—the median cost of a patent trial is reportedly $1.2 million.[195] The high cost of litigation might prevent independent inventors from enforcing their patents against large companies. Yet, recent examples show that independent inventors will enforce their patents when it is efficient to do so.[196] More and more companies today are investing in helping independent inventors

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[193]*See, e.g.*, Edmund L. Andrews, *A 'White Knight' Draws Cries of 'Patent Blackmail,'* N.Y. TIMES, Jan. 14, 1990, at C5 (noting juries "have proven eager to side with inventors against large companies"); Jonathon Taylor Reavill, *Tipping the Balance: Hilton Davis and the Shape of Equity in the Doctrine of Equivalents*, 38 WM. & MARY L. REV. 319, 366 (1996) ("juries also tend to idealize inventors"); Barry S. Wilson, *Patent Invalidity and the Seventh Amendment: Is the Jury Out?*, 34 SAN DIEGO L. REV. 1787, 1787 n.4 (1997) (noting juries prefer individual inventors challenging large corporations or foreign defendants).

[194]Kimberly A. Moore, *Jury Demands: Who's Asking?*, 17 BERKELEY TECH. L.J. 847, 852 (2002) [hereinafter Moore, *Jury Demands*].

[195]M. Patricia Thayer et al., *Examining Reexamination: Not Yet an Antidote to Litigation,* 5 SEDONA CONF. J. 23, 26 (2004).

[196]For example, in MercExchange, L.L.C. v. eBay, Inc., 275 F. Supp. 2d 695, 698 (E.D. Va. 2003), a small company won a suit against eBay for $105 million for the "Buy it Now" feature on eBay that allowed buyers to make fixed-price purchases instead of waiting for an auction to end. The damage award was later reduced on appeal. *See* MercExchange, L.L.C. v. ebay, Inc., 2005 U.S. App. LEXIS 4308, at *3 (Fed. Cir. Mar. 16, 2005). Another example is found in the independent inventor Jerome Lemelson, whose estate continues to enforce his patents years after his death.

pursue their claims against "the big guys."[197]

2. Adoption of the CII Directive Will Create Equal Information for Litigants

Another economic theory of litigation concludes that parties are least likely to settle when a case is close.[198] This theory should apply as well to the decision whether to litigate a software patent, regardless of the scope of protection at issue, as long as parties have equal information about their rights.

The settlement theory assumes equal information for both litigants.[199] Even if a court system favors a certain group of litigants, with equal information, both plaintiffs and defendants would know of the court system's propensity to favor or disfavor a group of litigants.[200] If both parties believe, for example, that a region's courts disfavor a class of claims, the parties will not press those claims to trial for the same reason that they will not press an objectively weak case to trial.[201] Both parties can agree on the outcome and both can save litigation costs by settling.[202] Similarly, if both parties believe a court will favor a claim, after considering any regional biases, both parties again will save litigation costs by settling before trial.[203]

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[197]*See* Teresa Riordan, *Trying to Cash in on Patents*, N.Y. Times, July 2, 2002, at C2 (reviewing an example, General Patent Corporation, which helps independent inventors enforce patents against large companies).

[198]*See* Moore, *Jury Demands*, *supra* note 194 (citing George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984) (noting tried cases are not a random sample of all disputes and only result when the parties make inconsistent and self-serving outcome estimations); *see also* Theodore Eisenberg, *Litigation Models and Trial Outcomes in Civil Rights and Prisoner Cases*, 77 GEO. L.J. 1567, 1568 (1989); Karl N. Llewellyn, THE BRAMBLE BUSH: ON OUR LAW AND ITS STUDY 62 (3d ed. 1960) (noting that litigated cases bear the same relationship to the underlying pool of disputes "as does homicidal mania or sleeping sickness, to our normal life").

[199]*See* Eisenberg, *supra* note 198, at 1586.

[200]*See id.*

[201]*Id.*

[202]*Id.*

[203]*Id.*

Only cases where parties have an uncertain outcome, adjusting for a region's propensities, actually go to trial.[204] Therefore, if large companies and their adversaries believe juries are hostile towards large corporations, the parties' filing and settlement decisions will offset the juries' or the legal system's bias. Litigation success rates should be similar to those in less hostile environments.[205]

The calculation of whether to go to trial is ultimately similar regardless of the scope of software patent protection or perceived biases in place in the court system. Yet, parties will only have equal information when they can reasonably calculate their likelihood of success at trial. This calculation is based on a reasonable assessment of the scope of their rights. However, the scope of patent protection for software in Europe is unclear, to both large companies and independent inventors.

Regarding the application of litigation selection theory to software patent law development in Europe, the amount of litigation in Europe will not necessarily increase with the adoption of the CII Directive. Instead, parties will have more certainty regarding the scope of their software patent rights, because they will have equal information about the scope of their rights. Therefore, litigation regarding software patents would not necessarily increase, at least not disproportionately for small or open-source developers.

With uniform rules in Europe, parties will have more equal information and can base their decisions regarding whether to pursue software patent protection accordingly. Further, with uniform rules, software patent disputes may proceed to litigation less frequently. Thus, selection effect theory supports proponents of software patent protection in Europe, and reveals that the dire predictions or anecdotal evidence about

[204] *Id.* at 1586-87.
[205] *See id.* at 1587.

the "horror" of software patents will not create the horrible reality feared by critics.

Until there is more empirical evidence on software patent litigation in both the United States and Europe, the calculation of whether to risk disclosing the invention by patenting it, or keeping the invention as a trade secret might remain unpredictable. Once information is more symmetrical, software patent applications in Europe would likely increase at a similar rate to the increase in United States applications, although business method patents may account for more filings in the United States and would be therefore absent from the increase in patents in Europe if the directive is adopted. Still, overall litigation of software patents is not likely to increase in Europe if the CII Directive is adopted by the Parliament.

It is unclear whether the European Parliament will vote to accept the CII Directive.[206] If the Parliament accepts the directive, then Europe will at least (and at last) have a settled rule, and can proceed on the right track to achieving more predictable software patent rights. A uniform rule regarding the scope of protection for software patents in the EU will not increase litigation in the long run, as opponents fear. Instead, by creating certainty regarding the scope of software patent rights, potential litigants will be able to calculate the expected risk of winning a trial.

Over time, litigation of software patents in Europe may approach a rate similar to that in the United States. In the U.S., very few patent cases actually go to trial—only about 5% reach the trial stage after years of discovery.[207] With similar rules and interests at stake, it is likely that

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[206] *See Software Patent Directive Adopted*, *at* http://news.zdnet.co.uk/0,39020330,39190497,00.htm.

[207] *See* Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889, 909 (2001) (finding 4996 of patent cases terminated from 1995 to 1999 ended before any significant court action; 46% of patent cases terminated from 1995 to 1999 ended after some court action but before trial; and only 5% of patent cases terminated from 1995 to 1999 ended during or after a trial began).

Europe's litigation rates will approach the same reasonable rate as the United States.

CONCLUSION

Currently, EU law is on the path to harmonization in software patent protection. Critics of software patents likely misperceive the threat of increased software patent protection in Europe. Open-source opponents of the CII Directive who fear software patents misunderstand the goals of the patent system. Further, in response to Poland's concerns, the plain language of the CII Directive prohibits the business method patents. Although it might take several years for EU law to achieve optimum levels of software patent protection, evaluations of United States software laws and trends in software patent prosecution reveal that software patents are not the "horror" in the United States that the opposition once feared. If the EU adopts the current CII Directive, the goals of the patent system in both the United States and Europe—innovation, investment, and disclosure—will be promoted.

Economic theory and empirical research indicate that software patent harmonization in Europe will not undermine computer-implemented innovation or development in the long run. Economic theory suggests that as long as the rules on software patent protection are clearly delineated, parties will adapt to the rules in place and invest in software development accordingly. Therefore, if the EU eventually adopts the directive, it is unlikely to result in reduced innovation or to hinder the open-source movement.