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CONTROLLING BUSINESS METHOD PATENTS: HOW THE JAPANESE STANDARD FOR PATENTING SOFTWARE COULD BRING REASONABLE LIMITATIONS TO BUSINESS METHOD PATENTS IN THE UNITED STATES

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Abstract: In recent years, the United States has expanded the scope of subject matter that can be patented. The Court of Appeals for the Federal Circuit has evolved a standard that allows inventors to patent software as long as it produces a useful and tangible result. Japan has also expanded the scope of patentable subject matter, but in a more limited fashion. Under the Japanese standard, the Japan Patent Office will only grant a patent to software inventions that apply a law of nature. The U.S. standard is too generous in allowing patents on software and business methods. Business method patents, in particular, are problematic because they are not consistent with the goals of patents and because they stray from the focus on granting patents to technology. Software patents, however, should not be overly limited because software is an area of technology and because software patents provide value to innovative parts of the economy. The United States should change its standard for determining whether an invention claims patentable subject matter by incorporating the Japanese standard. Under this standard, software inventions that control an apparatus or that work based on physical properties are considered patentable subject matter. Software inventions that do not meet this requirement will only be considered patentable subject matter if they show information processing performed by software as it is implemented in hardware. This standard would put limits on business method patents, including requiring that they be technological, while not overly limiting useful software patents. In addition, incorporating the Japanese standard would help the cause of patent law harmonization. Patentability of software has been a stumbling block for negotiations to harmonize patent law world-wide, but unilateral action in this area would improve the chances of countries agreeing to substantive patent law harmonization.

I. INTRODUCTION

Business methods have historically been excluded from patenting in all countries. However, recently that situation has changed in the United States. After the Court of Appeals for the Federal Circuit ruled in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*¹ that business methods were not excluded from patenting, the number of applications for business method patents received by the U.S. Patent and Trademark Office

[†] The author would like to thank Professor Toshiko Takenaka, Deborah Huang, and the editors of the *Pacific Rim Law & Policy Journal* for their help in the development of this comment.

¹ 149 F.3d 1368, 1375 (Fed. Cir. 1998).

(“USPTO”) increased from very few in 1997 to almost 8,000 in 2000.² Many commentators in the mass media argue that this has led to a broken patent system that grants patents for trivial inventions.³

A proposed definition of business methods defines one as “a method of . . . administering, managing, or otherwise operating an enterprise . . . including a technique used in . . . conducting business; or processing financial data.”⁴ The definition also includes techniques used in athletics, instruction or personal skill.⁵ There is some overlap between business method patents and software patents, because business method inventions are frequently implemented in software. However, software patents cover a wide range of inventions that are not considered business methods. Because of the close connection between the two areas, any discussion of business method patents must consider the general category of software patents as well.

Critics of business method patents argue that they are unnecessary and that allowing them has led to an increased number of “bad” patents—patents that should never have been granted by the patent office.⁶ Many also argue that business method patents should not be allowed because they are abstract ideas rather than concrete inventions.⁷ These same arguments have played out in Europe and Japan as well.⁸ Over the past two decades, national patent offices in those countries have changed and broadened the standards for what software and business methods may be patented.⁹ Since the government grants a patent monopoly in order to encourage innovation in technology,¹⁰ it is important to ensure that this monopoly is serving its purpose with business method patents.

This comment argues that the United States should adopt the Japanese standard for determining whether a software or business method invention is

² Bradley D. Lytle and John Dellinger, *Business Method Boot Camp: What Every IP Attorney Should Know About Business Method Patents*, <http://www.oblon.com/media/index.php?id=50> (last visited May 9, 2006).

³ See, e.g., Rob Pegoraro, *Blackberry Lawsuit is Patently Absurd*, WASHINGTON POST, Feb. 26, 2006, at D01; Eric Chabrow, *Patently Absurd – The U.S. Patent System Is in Disarray. Change Requires Not Just a Better System, But Better Patents, Too.*, INFORMATIONWEEK, Feb. 20, 2006, at 36.

⁴ H.R. 5364, 106th Cong. § 2 (2001).

⁵ *Id.*

⁶ See Rochelle Cooper Dreyfuss, *Essay: Are Business Methods Bad for Business?*, 16 SANTA CLARA COMPUTER & HIGH TECH. L.J. 263, 268 (May 2000).

⁷ *Id.* at 266.

⁸ See generally Hideo Furutani, *Patentability of Business Method Inventions in Japan Compared With the U.S. and Europe* 2-8 (2003), http://www.furutani.co.jp/office/ronbun/Business_method_patents_in_Japan.pdf (last visited October 20, 2006) (discussing the evolution of standards for patenting business methods in the United States, Japan and Europe).

⁹ *Id.*

¹⁰ See *infra* Part II.

patentable subject matter. The Japanese standard limits business method patents while still allowing patents on software. In addition, changing the U.S. standard would be a step toward eliminating one of the biggest obstacles to patent law harmonization. Part II provides a general background on common features of patent systems worldwide and describes essential concepts for understanding the contrasting standards. Part III explains the U.S. standard for patenting software and business methods and how it developed. Part IV explains the Japanese standard for patenting software and business methods. Part V describes the advantages of software patents and objections to business method patents. Part VI proposes that the United States should incorporate the elements of the Japanese standard for determining whether a software invention is patentable subject matter, because the proposed standard would limit business method patents while retaining most of the advantages of software patents. Part VII discusses how this change would also support efforts to harmonize world patent laws.

II. THE PATENT SYSTEM REPRESENTS A GOVERNMENT-SANCTIONED MONOPOLY TO ENCOURAGE INNOVATION

The patent system is unusual in that it is a government-sanctioned monopoly.¹¹ Patents were originally royal grants of monopoly in a particular area¹² but were outlawed by the Statute of Monopolies, except in the case of patent monopolies given to the “first and true inventor” of a “new manufacture.”¹³ The patent monopoly was acceptable because the cost of granting the right was balanced by the inventive contribution.¹⁴ The monopoly was intended to ensure that inventors would be able to enjoy the economic benefits of their efforts¹⁵ and to provide an incentive for inventors to share their inventions with the public.¹⁶ Patents were once justified as protecting a creator’s moral right to his invention¹⁷ and as a reward for creating a useful invention,¹⁸ but those views have fallen into disfavor.¹⁹

¹¹ FRITZ MACHLUP, AN ECONOMIC REVIEW OF THE PATENT SYSTEM, Subcomm. on Patents, Trademarks & Copyrights of the Senate Comm. on the Judiciary, 85th Cong., 2d Sess., at III (1958).

¹² *Id.* at 2.

¹³ *Id.* at 2-3.

¹⁴ *Id.* at III.

¹⁵ *Id.* at 19.

¹⁶ *Id.* at 21.

¹⁷ *Id.* at 22-23 (discussing the 1791 French patent law, which declared that inventors had a natural property right to their inventions).

¹⁸ *Id.* at 29.

¹⁹ *See id.* at 25-26.

In the United States, patents are authorized by Article I, Section 8 of the Constitution, which gives Congress the power to grant monopolies on “discoveries” in order “[t]o promote the progress of science and the useful arts.”²⁰ This has generally been interpreted to mean that patent protection can only be granted in the areas of “applied technology.”²¹ Other countries have similar minimum requirements.²²

If the patent examiner finds that the invention is patentable subject matter, he must then evaluate whether it meets the utility requirement. Under U.S. law, this means an inventor cannot get a patent for an invention without knowing what it can be used for.²³ In Japan, this is stated as a requirement that the invention must be “industrially applicable.”²⁴

In addition to being useful, an invention must be both novel²⁵ and nonobvious.²⁶ An invention is novel if there is no single piece of “prior art,” such as a patent or prior publication, that describes or anticipates that invention.²⁷ In the United States, an invention is unpatentable under the nonobviousness requirement if a person having ordinary skill in the art could have created it by combining elements from the prior art.²⁸ Similarly, Japan requires that an invention have an “inventive step,”²⁹ which means that a patent cannot be granted for an invention which a person having ordinary skill in the art could have invented based on known prior art.³⁰

Every patent application contains a specification, which must present sufficient information such that a person having ordinary skill in the art could recognize that the inventor has invented what is being claimed.³¹ The specification must also disclose sufficient information so that one skilled in the art could make the invention.³² Every application must include “claims particularly pointing out and distinctly claiming the subject matter which the

²⁰ U.S. CONST. art. I, § 8.

²¹ DONALD CHISUM, CHISUM ON PATENTS, § 1.01 (2005). In this context, “applied technology” is used in contrast to “science.” So, patents are not intended to protect knowledge *per se*, but the application of that knowledge in useful ways. *Id.* n.12.

²² *See, e.g.*, Japanese Patent Office Examination Guidelines, Part II, Chapter 1, at 1-3 [hereinafter JPO Examination Guidelines], available at http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/1312-002_e.htm (listing types of inventions that are not patentable).

²³ 35 U.S.C. § 101 (2000 & Supp. 2003).

²⁴ Tokkyo Hō [Patent Law], Law No. 121 of 1959, art. 29.

²⁵ 35 U.S.C. § 102 (2000 & Supp. 2003).

²⁶ *Id.* § 103.

²⁷ *Id.* § 102, Tokkyo Hō [Patent Law], Law No. 121 of 1959, art. 29.

²⁸ *See* Graham v. John Deere Co., 383 U.S. 1, 17 (1966).

²⁹ Tokkyo Hō [Patent Law], Law No. 121 of 1959, art. 29(2).

³⁰ ZENTARO KITAGAWA, 3-VI-2 DOING BUSINESS IN JAPAN § 2.02[3] (2005).

³¹ Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563 (Fed. Cir. 1991).

³² Gould v. Hellwarth, 472 F.2d 1383, 1386 (C.C.P.A. 1973).

applicant regards as his invention.”³³ The claims “define the metes and bounds of the right to exclude others from making, using or selling the invention,”³⁴ although the specification may be used as an aid to interpreting the claims.³⁵

III. THE UNITED STATES HAS STRUGGLED TO DEAL WITH BUSINESS METHOD PATENTS

The standard for patenting business methods has a long history. Many business method patents in recent years have been for business methods implemented in software on a general-purpose computer.³⁶ Because of this, the standard for determining patentability of software inventions is closely linked to the standard for patenting business methods.

The history of business method patents in the United States began with *Hotel Security Checking Co. v. Lorraine Co.*,³⁷ in which the court noted that “[a] system of transacting business disconnected from the means for carrying out the system is not . . . an art.”³⁸ This case was the basis for what became known as the “business method exception,” which stated that business methods are automatically unpatentable abstract ideas.³⁹

The distinction between technical processes and business methods started to blur with the spread of computers, as inventors started to push the boundaries of patentable subject matter.⁴⁰ The Supreme Court first attempted to clarify these boundaries in *Gottschalk v. Benson*,⁴¹ where it considered the question of whether software was patentable. The Court held that “[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”⁴² Instead, the Court said that patent-eligible subject matter resulted “from the application of the law of nature to produce a new and useful result.”⁴³

³³ 35 U.S.C. § 112 (2000 & Supp. 2003).

³⁴ *Hilton-Davis Chemical Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1539 (Fed. Cir. 1995).

³⁵ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005).

³⁶ This is true of many of the most controversial business method patents, such as Priceline’s reverse auction patent, U.S. Patent No. 5,794,207 (filed Sep. 4, 1996) and Amazon.com’s 1-click patent, U.S. Patent No. 5,960,411 (filed Sep. 12, 1997).

³⁷ 160 F. 467 (2d Cir. 1908).

³⁸ *Id.* at 469. The patent was actually found invalid based on other criteria. *Id.* at 472.

³⁹ *See, e.g., In re Schrader*, 22 F.3d 290, 298 (Fed. Cir. 1994) (Newman, J., dissenting); *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 927 F. Supp. 502, 515 (D. Mass. 1996).

⁴⁰ CHISUM, *supra* note 21, § 1.03[5].

⁴¹ 409 U.S. 63 (1972).

⁴² *Id.* at 67.

⁴³ *Id.*, quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

This ruling was supplemented in *Parker v. Flook*.⁴⁴ The Court held that while including a law of nature or mathematical algorithm did not automatically disqualify patentability,⁴⁵ an invention had to include “some other inventive concept in its application” in order to be patentable.⁴⁶ The USPTO interpreted *Flook* to bar any computer-related inventions from patentability and rejected all applications for patents on such inventions.⁴⁷

However, the Supreme Court soon contradicted this interpretation in *Diamond v. Diehr*,⁴⁸ holding that a process for curing rubber did not become unpatentable just because one part was controlled by a computer.⁴⁹ The Court first noted that “laws of nature, natural phenomena, and abstract ideas” are specifically denied patentability.⁵⁰ However, the Court then held that “an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”⁵¹ After *Diehr*, the question became whether the formula described in the claim was part of a structure or process that “when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing”⁵²

At about the same time the Supreme Court ruled on *Diehr*, the Court significantly broadened the scope of patentable subject matter for biotechnology inventions in *Diamond v. Chakrabarty*.⁵³ In allowing the applicant to patent a type of bacteria, the Court said, “In choosing such expansive terms as ‘manufacture’ and ‘composition of matter,’ modified by the comprehensive ‘any,’ Congress plainly contemplated that the patent laws would be given wide scope.”⁵⁴ The Court then noted that “Congress intended statutory subject matter to ‘include anything under the sun that is made by man.’”⁵⁵

In the years after *Flook* and *Diehr*, the Court of Appeals for the Federal Circuit developed the Freeman-Walter-Abele test to limit the patentability of software inventions.⁵⁶ However, in the 1990s, momentum

⁴⁴ 437 U.S. 584 (1978).

⁴⁵ *Id.* at 590.

⁴⁶ *Id.* at 594.

⁴⁷ CHISUM, *supra* note 21, § 1.03[6][f].

⁴⁸ 450 U.S. 175 (1981).

⁴⁹ *Id.* at 187.

⁵⁰ *Id.* at 185.

⁵¹ *Id.* at 187.

⁵² *Id.* at 192.

⁵³ 447 U.S. 303 (1980).

⁵⁴ *Id.* at 308.

⁵⁵ *Id.* at 309.

⁵⁶ CHISUM, *supra* note 21, § 1.03[6][i].

started to build in favor of relaxing the standards for patentable subject matter.⁵⁷ In *In re Alappat*,⁵⁸ the Federal Circuit held that an invention would not be eliminated from patentability just because the claim “would read on a general-purpose computer programmed to carry out the invention.”⁵⁹

In *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,⁶⁰ the Federal Circuit completely eliminated the mathematical algorithm and business method exceptions. The court held that mathematical algorithms were excluded from patentability only insofar as they were abstract ideas, but they were not inherently excluded.⁶¹ The court then held that an algorithm was patentable if it was used to create a “useful, concrete and tangible result.”⁶² Finally, the court eliminated the business method exception, noting that there was no statutory or caselaw support for it.⁶³ A year later, in *AT&T Corp. v. Excel Communications, Inc.*,⁶⁴ the court broadened the *State Street* holding to include process claims, in addition to machine claims of the type at issue in *State Street*.⁶⁵

Unsurprisingly, the number of business method patent applications increased significantly in the years immediately following *State Street* and *AT&T Corp.* While previously there had been few business method patent applications, the USPTO received 2,821 applications in 1999.⁶⁶ The following year, that number rose to 7,800.⁶⁷ The USPTO has implemented a number of measures to handle the increase,⁶⁸ but the backlog in applications continues to grow.⁶⁹

⁵⁷ See, e.g., *In re Schrader*, 22 F.3d 290, 298 (Fed. Cir. 1994) (Newman, J., dissenting) (arguing that the business method exception was poorly defined and unnecessary and that cases supporting the business method exception were actually decided on other grounds, such as novelty or nonobviousness).

⁵⁸ *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994).

⁵⁹ *Id.* at 1545.

⁶⁰ 149 F.3d 1368 (Fed. Cir. 1998).

⁶¹ *Id.* at 1373.

⁶² *Id.*

⁶³ *Id.* at 1375.

⁶⁴ 172 F.3d 1352 (Fed. Cir. 1999).

⁶⁵ *Id.* at 1358.

⁶⁶ Lytle and Dellinger, *supra* note 2.

⁶⁷ *Id.*

⁶⁸ See generally United States Patent and Trademark Office, A USPTO White Paper: Automated Financial or Management Data Processing Methods (Business Methods), available at <http://www.uspto.gov/web/menu/busmethp/whitepaper.pdf>.

⁶⁹ Dennis Crouch, *Updated Business Method Patent Statistics*, PATENTLY-O: PATENT LAW BLOG, http://patentlaw.typepad.com/patent/2005/05/updated_busines.html (last visited April 25, 2006).

IV. JAPAN ALSO HAS STRUGGLED TO FIND THE RIGHT STANDARD FOR SOFTWARE AND BUSINESS METHOD PATENTS

Japan has taken a different path in dealing with the challenges presented by software and business method patents. Japan is one of the most important countries in the world patent system, with nineteen percent of patents in force in 2003;⁷⁰ therefore, its system offers lessons that are applicable to the United States as well.

Under the Japanese system, the general rules for patentability apply to all inventions, including software.⁷¹ In addition, software inventions are subject to special treatment under a second set of rules that specifically address computer-related inventions.⁷²

A. *Japanese Patent Law Requires That All Patentable Inventions Apply a Law of Nature and Be Applicable to Industrial Use*

The Japanese standard for patentable subject matter has a shorter and somewhat less tempestuous history than the U.S. standard. Unlike the relaxed U.S. standard, the Japanese standard is stricter and more complex.

Japanese patent law defines an invention as “the highly advanced creation of technical ideas by which a law of nature is utilized.”⁷³ In this context, the word “highly” is not used for determining patentability but is used only to distinguish patents from utility models, which provide a lower level of protection for an invention.⁷⁴ Therefore, the key requirement for a device or process to be considered a patentable invention is that it must be a creation of technical ideas that uses a law of nature.

The word “nature,” in the Japanese patent law, is used in the same sense as “natural science.”⁷⁵ Discovery of a law of nature is not sufficient – in order to be a patentable invention, the invention must apply a law of nature to solve a particular problem.⁷⁶ Some inventions that have been denied patents on this basis include an advertising method and a method for making a telegraphic code combining Roman letters, figures and signs.⁷⁷

⁷⁰ In 2003, 49% of patents in force were in the United States or Japan. TRILATERAL CO-OPERATION, TRILATERAL STATISTICAL REPORT: 2004 EDITION 5, available at http://www.trilateral.net/tsr/tsr_2004/tsr2004.pdf.

⁷¹ JPO Examination Guidelines, *supra* note 22, Part VII, Chapter 1, at 2.

⁷² *Id.*

⁷³ Tokyo Hō [Patent Law], Law No. 121 of 1959, art. 2.

⁷⁴ JPO Examination Guidelines, *supra* note 22, Part II, Chapter 1, at 1.

⁷⁵ KITAGAWA, *supra* note 30, § 2.01[1].

⁷⁶ *Id.* § 2.01[3].

⁷⁷ *Id.* § 2.01[1].

The Japan Patent Office (“JPO”) examination guidelines list a number of categories of invention that are unpatentable for not meeting this requirement.⁷⁸ Most importantly, they exclude patentability for inventions that use laws other than laws of nature, such as economic laws or arbitrary arrangements.⁷⁹ The guidelines exclude computer programming languages and pure business methods from patentability on this basis.⁸⁰

In addition to the base requirement defined above, the invention must be capable of industrial use.⁸¹ The JPO examination guidelines note that “[i]ndustry” is interpreted in a broad sense, including mining, agriculture, fishery, transportation, telecommunications, etc., as well as manufacturing.⁸² The examination guidelines enumerate a set of inventions that are considered industrially inapplicable, such as medical procedures performed on humans.⁸³ Also included are commercially inapplicable inventions, such as methods with purely personal uses (e.g. a method for smoking) and inventions applied only for scientific or experimental purposes.⁸⁴

B. *The JPO Provides Special Treatment for Computer-Related Inventions*

Rather than use a one-size-fits-all approach, the JPO sets special guidelines for determining patentability of software inventions. These special requirements ensure that software inventions meet the base requirement that a patentable invention must “utiliz[e] a law of nature.”⁸⁵ A business method implemented in software may be patentable if the invention meets these requirements.⁸⁶

The JPO made an early attempt to define standards for patentability of software with examination guidelines issued in 1975.⁸⁷ The guidelines stated that software was only patentable when it was incorporated into an apparatus or system.⁸⁸ An example of this requirement is using software to control the operation of an industrial process in a mill.⁸⁹ The JPO set this requirement to ensure that software inventions would meet the “law of

⁷⁸ See JPO Examination Guidelines, *supra* note 22, Part II, Chapter 1, at 1-3.

⁷⁹ See *id.*, Part II, Chapter 1, at 1-2.

⁸⁰ See *id.*, Part II, Chapter 1, at 2.

⁸¹ Tokkyo Hō [Patent Law], Law No. 121 of 1959, art. 29.

⁸² JPO Examination Guidelines, *supra* note 22, Part II, Chapter 1, at 4.

⁸³ *Id.* Part II, Chapter 1, at 4.

⁸⁴ *Id.* Part II, Chapter 1, at 7.

⁸⁵ *Id.* Part VII, Chapter 1, at 11.

⁸⁶ *Id.* Part II, Chapter 1, at 2-3.

⁸⁷ Furutani, *supra* note 8, at 2-3.

⁸⁸ KITAGAWA, *supra* note 30, § 2.01[7].

⁸⁹ *Id.*

nature” requirement of the patent law.⁹⁰ Under the 1975 standards, computer languages were specifically declared unpatentable, because they were just symbolic codes.⁹¹ Also considered unpatentable were programs for processing data, because they were “regarded as merely methods for displaying or reporting social or natural phenomena by an assembly of numerals or symbols.”⁹² The JPO applied these standards in 1980 to deny a patent on a method for classifying data using a computer, because the invention was related to a mathematical operation rather than control of a computer.⁹³

In 1993, the JPO issued a new version of the examination guidelines that relaxed the standard.⁹⁴ The new guidelines allowed patentability for computer programs that handled non-technical operations, such as word processing, if the programs were carried out using hardware resources on the computer.⁹⁵ The JPO also eliminated the “Point of Novelty Approach,” under which the patent office evaluated the patentability of an invention based only on the novel part of the invention.⁹⁶ Instead, patentability was to be determined based on the whole invention.⁹⁷

In 2000, the JPO issued its latest version of the Examination Guidelines, which remains in effect.⁹⁸ The JPO’s goal for the latest version was to update its guidelines to better handle business method patents.⁹⁹ The changes focused on the standards for determining whether inventions meet the inventive step requirement.¹⁰⁰

Under the current examination guidelines for software-related patents, inventors may claim both methods and products.¹⁰¹ A method claim defines the invention by a series of operations in a time series.¹⁰² A product claim defines the invention in terms of the functions performed by the software.¹⁰³ In addition, all claims must clearly show that a computer is performing the

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.*

⁹³ Furutani, *supra* note 8, at 3.

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.* at 3-4.

⁹⁹ TRILATERAL CO-OPERATION, TRILATERAL STATISTICAL REPORT 2001 10, available at http://www.trilateral.net/tsr/tsr_2001/tsr_2001.pdf.

¹⁰⁰ SHINJIRO ONO, SUBSTANTIVE PATENT HARMONIZATION AND JAPAN’S STANCE 4, <http://www.law.washington.edu/casrip/Symposium/Number8/CM%20-%20Ono.pdf> (last visited May 11, 2006).

¹⁰¹ JPO Examination Guidelines, *supra* note 22, Part VII, Chapter 1, at 3.

¹⁰² *Id.*

¹⁰³ *Id.*

actions described.¹⁰⁴ According to the JPO, failing to do so may make the claims invalid because they do not meet the requirement that the “invention . . . must be clearly stated.”¹⁰⁵ For example, an inventor cannot simply claim “[a]n order-receiving method using a computer, comprising the steps of . . .”, because the claim would be unclear as to whether the steps were to be carried out by a computer or by a human using the computer for assistance.¹⁰⁶

Although the examination guidelines have a special section for computer-related inventions, not every invention that uses software is required to be evaluated using that section.¹⁰⁷ For instance, if the application claims subject matter that is specifically non-statutory, such as an invention that applies economic laws only or that is mere presentation of data, the invention is not patentable.¹⁰⁸ In contrast, some inventions clearly make use of a law of nature, without any need to consider the special rules.¹⁰⁹ These inventions can simply be evaluated under the general examination guidelines.¹¹⁰ If the invention uses a computer to control an apparatus, such as a rice cooker, it should be evaluated under the general requirements for industrial inventions.¹¹¹ Similarly, if the invention is a computer that works based on physical properties of an object, such as the rotation rate of an engine, it should be evaluated under the general requirements.¹¹²

If the invention cannot be evaluated under the general requirements, it will be evaluated under the software-specific standards. These requirements ensure that the claimed software invention uses a law of nature.¹¹³ To be patentable, a software invention must claim “information processing by software [that] is concretely realized by using hardware resources.”¹¹⁴ That is, the claims must describe how the computer reads the software and uses the software in combination with the computer hardware to perform arithmetic or information manipulation.¹¹⁵ Even if the specification

¹⁰⁴ *Id.* Part VII, Chapter 1, at 5.

¹⁰⁵ *Id.* Part VII, Chapter 1, at 4 (quoting Japanese Patent Law, Section 36(6)(ii)).

¹⁰⁶ *Id.* Part VII, Chapter 1, at 4-5.

¹⁰⁷ *See id.* Part VII, Chapter 1, at 12-13.

¹⁰⁸ *Id.* Part VII, Chapter 1, at 13.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² *Id.*

¹¹³ *Id.* Part VII, Chapter 1, at 11.

¹¹⁴ *Id.*

¹¹⁵ *Id.* As an example, under this standard the JPO allowed a version of Citibank’s electronic cash patent, U.S. Patent No. 5,455,407 (filed January 27, 1995). The following claim met the JPO requirements and was allowed in Japan Patent No. 3604151:

describes a patentable system, the system will not be patentable unless the claims describe hardware and software working together.¹¹⁶ This is distinct from the U.S. standard, which does not require any reference to hardware.¹¹⁷

The JPO has struggled with the same set of issues as the USPTO in determining how to deal with software and business method patents. Unlike the United States, Japan has not abandoned subject matter as a restriction on patentability. Instead, Japan has developed a specialized set of rules to ensure that software inventions meet the general requirement that patentable inventions must use a law of nature. In addition, the JPO has carved out a group of software patents that do not require special treatment. In doing so, the JPO has attempted to find a balance between allowing patents in a broad area of technology and maintaining reasonable restrictions on the types of allowable patents.

V. THE U.S. PATENT SYSTEM SHOULD ADOPT A STANDARD THAT ALLOWS PATENTS FOR USEFUL SOFTWARE INVENTIONS BUT LIMITS PATENTS ON BUSINESS METHODS

The standard for determining what is patentable subject matter should first ensure that the patent rights granted are sufficient to encourage the development of new fields of technology. This should be balanced against the need to ensure that there are sufficient limits on the monopoly rights being granted to new technology. Because the categories of software patents and business method patents are closely related, any standard that affects one will tend to affect the other. The United States should adopt a new standard that balances the need to encourage innovation in software with the equally important need to limit patents on inventions that are purely methods of doing business.

A system for transferring electric notes between electronic modules, comprising:

electronic modules, each of which has a processor and memory therein, wherein the electronic modules are capable of establishing a cryptographically secure channel and transferring and receiving the electronic notes through the cryptographically secure channel, and memorizing the electronic notes into the memory;

wherein the memorized electronic notes comprises

a body group of data fields which include data indicative of monetary value associated with the electronic note; and

a transfer group of data fields that include a transfer record list, wherein each of transfer record list includes a sequence number that distinguishes the transferred electronic note generated by a transferor electronic module from one or more of the other transferred electronic note that have been transferred from a common electronic module of transfer source and have been made from a common electronic note.

¹¹⁶ JPO Examination Guidelines, *supra* note 22, Part VII, Chapter 1, at 13-14.

¹¹⁷ Motohiko Fujimura, *Recent Revision of JPO's Examination Guideline for Computer Software-Related Inventions*, 26 AIPPI J. 212 (July 2001).

A. *Software Inventions Should Be Patentable Because They Serve Useful Economic Purposes*

In many industries, functions that would have been implemented in hardware in the past are now implemented in software. The Supreme Court recognized this practice in *Diamond v. Diehr*,¹¹⁸ when it held that a manufacturing process did not become unpatentable simply because a general-purpose computer was involved in one step.¹¹⁹ Most modern software patents are for similar inventions that merely shift functionality from hardware to software. The vast majority of software patents are acquired by companies in industries other than the software industry.¹²⁰ A recent study found that manufacturing companies in the United States received seventy-five percent of software patents, compared to thirteen percent for companies in software publishing and services.¹²¹ Patents from manufacturing companies tend to be for manufacturing processes, so there is little risk that the companies will attempt to claim abstract ideas.

Software patents are useful within the software industry as well. Recent history suggests that the software industry can benefit from the incentives provided by patents. For many years, economists wondered why businesses' increased use of computers and information technology did not result in faster productivity growth.¹²² For the two decades prior to 1995, productivity growth in the United States averaged only 1.5% a year, despite efficiency improvements expected from increased computerization of the workplace.¹²³ However, since 1995, productivity growth has doubled to three percent per year and remained high even as the country went through a recession and slow economic recovery.¹²⁴ Some economists have suggested that the increase came as businesses adapted to take advantage of the new technology.¹²⁵

This adaptation to new technology suggests that there may be some benefit to allowing patents on software to encourage further development in the area. It is possible that the key to increased productivity was not the introduction of computers into the workplace, but the introduction of useful new applications that allow businesses to better make use of those

¹¹⁸ 450 U.S. 175 (1981)

¹¹⁹ *Id.* at 187.

¹²⁰ JAMES BESSEN AND ROBERT M. HUNT, AN EMPIRICAL LOOK AT SOFTWARE PATENTS 15 (2004), available at <http://www.researchoninnovation.org/swpat.pdf>.

¹²¹ *Id.* at 16.

¹²² *The New "New Economy" – American Productivity*, THE ECONOMIST, September 13, 2003.

¹²³ *Id.*

¹²⁴ *Id.*

¹²⁵ *Id.*

computers.¹²⁶ Allowing patents on nonobvious but incremental improvements in business software might be the incentive that is needed to encourage businesses to take advantage of the technology.

More concretely, software patents provide a boost to many software startups, which produce some of the most important innovations in the software industry.¹²⁷ A recent survey of venture capitalists and executives from software startups found that patents can be very useful to startups that have begun marketing their products.¹²⁸ The survey found that patents do not provide much advantage to pre-revenue startups because of the costs of enforcing a patent and because the company does not yet have a product to protect.¹²⁹ However, the same survey also found that a patent can help a company in the early days of selling its product by allowing continued innovation free from competition.¹³⁰ A patent can also encourage larger companies to acquire the startup by providing information about the startup's innovations.¹³¹

These benefits sufficiently justify allowing software patents. However, such justifications should not extend so far as to cover business method patents as well.

B. The Costs of Business Method Patents Outweigh the Benefits

One major concern with business method patents is that they are often of lower quality, meaning that they should have been denied patentability based on novelty or nonobviousness. In particular, there are many patents that have been awarded on relatively mundane business inventions.¹³² For instance, inventions such as online shopping carts,¹³³ online credit card payments,¹³⁴ and online affiliate programs¹³⁵ have received patents that some advocacy groups argue should have been denied as obvious or lacking novelty.¹³⁶ Under *State Street*, business method patents are supposed to be

¹²⁶ Dreyfuss, *supra* note 6, at 265.

¹²⁷ Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 TEX. L. REV. 961, 973, 985 (2005).

¹²⁸ *Id.* at 985.

¹²⁹ *Id.* at 981-82.

¹³⁰ *Id.* at 985-86.

¹³¹ *See id.* at 993-94.

¹³² Dreyfuss, *supra* note 6, at 268.

¹³³ U.S. Patent No. 5,715,314 (filed Oct. 24, 1994).

¹³⁴ U.S. Patent No. 6,289,319 (filed Nov. 30, 1994).

¹³⁵ U.S. Patent No. 6,029,141 (filed June 27, 1997).

¹³⁶ *See, e.g.* Electronic Frontier Foundation Patent Busting Project, <http://www.eff.org/patent/> (last visited April 27, 2006) (describing the EFF's attempt to invalidate a number of software patents).

held to the same requirements as other types of patents,¹³⁷ but they pose special challenges that make them harder for examiners to reject.¹³⁸ A particular problem is that patent examiners rarely cite non-patent prior art.¹³⁹ This makes business method patents more likely to be granted, because the field lacks prior art patents.¹⁴⁰ Many well-known business methods are poorly documented for use in a patent search, because they are implemented in policies and practices that are not easily accessible to a patent examiner.¹⁴¹ In addition, prior to *State Street*, businesses that invented new business methods were more likely to protect them using trade secret law.¹⁴² As such, an examiner would not be able to find information about these secret business methods to use as prior art when examining new applications.¹⁴³

In infringement trials, these poor-quality patents should be found invalid, because the defendants have a much greater incentive to bring forward invalidating prior art. However, in some cases the subjective element of the evaluation will unfairly influence the judge's decision.¹⁴⁴ Judges are more likely to find inventions patentable in poorly-known or poorly-understood fields.¹⁴⁵ This tendency may favor certain hard-to-understand types of business method patents.¹⁴⁶

Even if these low-quality patents are eventually invalidated by a court, they can still cause damage. The possibility of an injunction if they lose a lawsuit leads many accused infringers to settle rather than risk a trial.¹⁴⁷ Accused infringers often prefer to avoid the costs of litigation and choose to settle, even if the patent being asserted is likely to be invalid.¹⁴⁸ In addition, even if the patent is eventually found invalid, it can have major effects on the market because the patent owner is able to gain advantages that do not

¹³⁷ *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1377 (Fed. Cir. 1998).

¹³⁸ Dreyfuss, *supra* note 6, at 268-69.

¹³⁹ *Id.* at 269.

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² John R. Allison and Emerson H. Tiller, *The Business Method Patent Myth*, 18 BERKELEY TECH. L.J. 987, 1015 (2003).

¹⁴³ *Id.* Congress partially addressed this in the American Inventors Protection Act by creating the prior user defense. The Act created a defense to infringement of business method patents if the defendant is able to show that they were using the claimed invention at least a year before the filing date of the patent being asserted. 35 U.S.C. § 273 (2005). However, this has no effect on the prior art for purposes of examining new applications for business method patents.

¹⁴⁴ Dreyfuss, *supra* note 6, at 269-70.

¹⁴⁵ *Id.* at 270.

¹⁴⁶ *Id.*

¹⁴⁷ Mark A. Lemley, *Patent Reform Legislation – Public Comments on Substitute HR 2795 and the Role of the Antitrust Modernization Committee* 8 (October 24, 2005), http://www.amc.gov/commission_hearings/pdf/Statement_Lemley.pdf (last visited October 21, 2006).

¹⁴⁸ Dreyfuss, *supra* note 6, at 270.

disappear after invalidation.¹⁴⁹ The time during which the patentee received erroneous patent protection might be enough to gain customer loyalty sufficient to maintain its advantage afterwards.¹⁵⁰

The litigation between Amazon.com and Barnes & Noble over Amazon's 1-click patent¹⁵¹ provides a concrete example of these problems. Amazon.com received a patent in 1999 on a system that allowed customers to buy items without having to re-enter their shipping and billing data and quickly sued Barnes & Noble, who had a similar system on their site, for patent infringement.¹⁵² Many groups believed the patent to be invalid, but Barnes & Noble settled after two years rather than incur the expense of continued litigation.¹⁵³ This demonstrates how companies prefer to settle rather than to fight a potentially invalid patent at trial. To understand the advantages that an invalid patent may provide, imagine that Amazon's patent had been found invalid after several years of litigation. By this time, Amazon's customers would have become accustomed to the convenience of shopping at Amazon compared to other online retailers. Even though other retailers would now be able to provide the same convenience, many customers would stay with the website with which they were familiar. In this way, the "stickiness" of a service like 1-click could provide advantages even if the patent were eventually found invalid.¹⁵⁴

An additional objection to business method patents is that they may be unnecessary. The patent system is intended to provide an incentive for invention and public propagation of such inventions.¹⁵⁵ Therefore, before patent protection is extended to a new field, there should be some consideration of whether that protection is necessary to achieve those goals. The key question is whether the incentive provided by the patent monopoly is large enough to balance the loss to the economy from the monopoly.¹⁵⁶

The process of evaluating the value of business method patents is made more difficult by the fact that some people, generally patent holders, believe that any idea or concept that has value should be protected by the law.¹⁵⁷ However, the U.S. legal system has never gone that far. The Framers

¹⁴⁹ *Id.*

¹⁵⁰ *Id.* at 271.

¹⁵¹ U.S. Patent No. 5,960,411 (filed Sep. 12, 1997).

¹⁵² Laura Rohde, *Amazon, Barnes & Noble settle patent dispute*, cnn.com, March 7, 2002, <http://archives.cnn.com/2002/TECH/industry/03/08/amazon.bn.dispute.idg/> (last visited April 26, 2006).

¹⁵³ *Id.*

¹⁵⁴ Dreyfuss, *supra* note 6, at 271.

¹⁵⁵ *See supra* Part II.

¹⁵⁶ Leo J. Raskind, *The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 61, 71 (1999).

¹⁵⁷ *See* Dreyfuss, *supra* note 6, at 274.

of the Constitution rejected the “just deserts”¹⁵⁸ approach, the idea that the patent is a reward for invention, in favor of the result-oriented statement that Congress could create a patent system to “promote the Progress of Science and useful Arts”¹⁵⁹ Therefore, the decision on whether to allow a class of patents should be based on a balancing of costs and benefits.

Of course, there is an argument in favor of allowing business method patents—that is, providing protection for business method inventions encourages innovation in business methods just as it would any other area.¹⁶⁰ In general, the legal system recognizes a property right when it is necessary to prevent a tragedy of the commons, i.e. to prevent free-riders.¹⁶¹ The argument, then, is that if business methods are patentable, businesses will have an incentive to develop new methods in order to get their own protection and to work around those methods already patented by competitors.¹⁶²

However, this argument does not justify allowing business method patents because the same incentive is already built into the free market system.¹⁶³ Companies must develop more efficient or more effective methods of doing business in order to succeed against their competitors.¹⁶⁴ In fact, an effective business method can be its own reward.¹⁶⁵ Sticky business methods that bring customer loyalty or network effects will bring competitive advantage to the company that invents those methods, even without patent protection.¹⁶⁶ As Professor Rochelle Dreyfuss of New York University said, “With lock in, network effects, and even good old fashioned loyalty, lead time (the first mover advantage) goes a long way to assuring returns adequate to recoup costs and earn substantial profit.”¹⁶⁷ While innovation in business methods is a good thing, it is likely that there would be the same level of innovation even without patents on them.

Not only does the free market system make business method patents unnecessary, such patents can actually be damaging to the free market

¹⁵⁸ *Id.* at 274-75.

¹⁵⁹ U.S. CONST., art. I, § 8.

¹⁶⁰ Jeffrey R. Kuester and Lawrence E. Thompson, *Risks Associated with Restricting Business Method and E-Commerce Patents*, 17 GA. ST. U. L. REV. 657, 674 (2001).

¹⁶¹ Dreyfuss, *supra* note 6, at 274.

¹⁶² Francisc Marius Keeley-Domokos, *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 14 BERKELEY TECH. L. J. 153, 167 (1999).

¹⁶³ *Id.* at 167-68.

¹⁶⁴ *Id.* at 167-68.

¹⁶⁵ Dreyfuss, *supra* note 6, at 275.

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

system.¹⁶⁸ The system works based on the idea that companies are competing on a level playing field, so that the best and most efficient company will win.¹⁶⁹ Just like in a sporting event, the rules should be equal for both sides.¹⁷⁰ By giving a patent monopoly on particular business practices, the government distorts the operation of the free market system and reduces the gains from the operation of the market.¹⁷¹ In the free market system, players should succeed in the free market based on superior skill and implementation.

A particular problem in the United States is that business method patents do not have to be technological. This is inconsistent with the Constitution and with Supreme Court precedent. The Framers did not intend “useful arts” to mean every created thing.¹⁷² At the time, the term “useful arts” was commonly used in contrast to the ideas of the “liberal arts” and the “fine arts,” which were well-known ideas in the eighteenth century.¹⁷³ In *In re Bergy*,¹⁷⁴ the Court of Customs and Patent Appeals, the predecessor court to the Federal Circuit, described a technological requirement when it noted that “the present day equivalent of the term ‘useful arts’ employed by the Founding Fathers is ‘technological arts.’”¹⁷⁵

The Supreme Court also laid out a similar requirement in *Benson* and *Diehr*. In setting the standards for patenting software, the Court in *Benson* and *Diehr* cited *Funk Bros. Seed Co. v. Kalo Inoculant Co.* to support the holding that patentable subject matter must result “from the application of the law of nature to produce a new and useful end.”¹⁷⁶ One definition of technology is simply that it is applied science.¹⁷⁷ Since science is an attempt to understand the laws of nature, the Court’s holdings in *Benson* and *Diehr* are really stating a requirement that inventions must be technological.¹⁷⁸ However, when the Federal Circuit eliminated the business method exception in *State Street*, they restated the standard for patentable subject matter as simply something that produces a “useful, concrete and tangible

¹⁶⁸ See *id.* at 276.

¹⁶⁹ *Id.*

¹⁷⁰ *Id.*

¹⁷¹ *Id.*

¹⁷² John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1164 (1999).

¹⁷³ *Id.*

¹⁷⁴ 596 F.2d 952 (C.C.P.A. 1979).

¹⁷⁵ *Id.* at 959.

¹⁷⁶ *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) and *Diamond v. Diehr*, 450 U.S. 175, 188 n.11 (1981) both cite this quote from *Funk Bros Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

¹⁷⁷ Thomas, *supra* note 172, at 1167.

¹⁷⁸ Toshiko Takenaka, *The Best Patent Practice or Mere Compromise? A Review of the Current Draft of the Substantive Patent Law Treaty and a Proposal for a “First-To-Invent” Exception for Domestic Applicants*, 11 TEXAS INTELL. PROP. L.J. 259, 336 (2003).

result.” In the process, the court eliminated the Supreme Court’s requirement that patentable inventions must also be “applications of the law of nature.”

A recent case before the Board of Patent Appeals and Interferences (“BPAI”), *Ex parte Lundgren*,¹⁷⁹ demonstrates this lack of a technology requirement. The patent at issue in *Lundgren* claimed a method for determining the compensation of managers in industries that are susceptible to collusion.¹⁸⁰ Unlike common practice for business method patents, the *Lundgren* application did not describe the use of a computer as part of the implementation.¹⁸¹ The examiner rejected the application as “nothing more than an abstract idea which is not associated or connected to any technological art.”¹⁸² The BPAI overruled the rejection, holding that there was no separate requirement that patents must be in the “technological arts” in order to be patentable subject matter.¹⁸³ In so doing, the BPAI showed that the current standard for patentable subject matter has left behind the constitutional requirement that patents arise from the “useful arts” and be an “application of the law of nature.”

Finally, the fundamental problem with business method patents is the difficulty of differentiating between processes that are principles and those that are patentable applications.¹⁸⁴ The challenge is to keep people from patenting laws of nature or abstract concepts.¹⁸⁵ The Freeman-Walter-Abele test tried to solve this by ensuring that software inventions must show a connection to a physical implementation in order to receive a patent.¹⁸⁶ When the Federal Circuit swept away that requirement in *State Street*, it became much easier to patent abstract concepts. The United States should move towards a standard that would limit this danger.

VI. INCORPORATING THE JAPANESE STANDARD FOR DETERMINING PATENTABILITY OF SOFTWARE INVENTIONS WOULD BETTER ENABLE THE UNITED STATES TO GRANT PATENTS FOR SOFTWARE INVENTIONS WHILE DENYING PATENTS TO BUSINESS METHODS

There are a number of problems with business method patents in the United States. The challenge is to construct a standard for patentability in

¹⁷⁹ 76 U.S.P.Q.2d 1385 (B.P.A.I. 2004).

¹⁸⁰ *Id.*

¹⁸¹ *Id.*

¹⁸² *Id.* at 1386 n1.

¹⁸³ *Id.* at 1388.

¹⁸⁴ Dreyfuss, *supra* note 6, at 266.

¹⁸⁵ *Id.*

¹⁸⁶ *Id.*

this area that restricts the patenting of business methods but does not exclude patenting desirable software inventions. At the same time, a new standard for patentable subject matter should reinstate the “law of nature” requirement that the Federal Circuit failed to retain in *State Street*.¹⁸⁷ The United States should accomplish this by combining the standards of the Japanese and U.S. systems.

The proposed standard would have two overarching requirements. First, it would require that a patentable invention must be a technical idea implementing a law of nature. Second, it would modify the utility requirement by combining the U.S. requirement of utility with the parallel Japanese requirement of industrial applicability.

To ensure that inventions meet the requirement of implementing a law of nature, the proposed standard would use the elaboration provided by Japanese law. First, inventions that use software to control an apparatus or that work by processing data about an object will always be considered statutory and should be evaluated based on the other patentability requirements, such as novelty and nonobviousness.¹⁸⁸ Under Japanese law, some classes of software inventions are not subject to special treatment for determining whether they meet the law of nature requirement.¹⁸⁹ Patents to inventions that use software to control an apparatus or that work based on physical properties of an object are considered statutory and are treated as regular industrial inventions, rather than as software patents.¹⁹⁰ The proposed standard would retain this exclusion. This would be consistent with the Supreme Court’s ruling in *Diehr*, since the invention found patentable in that case used software to control a manufacturing process.¹⁹¹

If the invention is not considered an application of a law of nature based on the first test, it can meet the requirement by showing “information processing by software . . . concretely realized by using hardware resources.”¹⁹² Under the Japanese standard, the claims must specifically show how the invention uses software to control hardware to achieve a useful result.¹⁹³ The proposed standard would use this requirement as a second stage to ensure that software inventions meet the requirement of implementing a law of nature.

¹⁸⁷ See *supra* Part V.B.

¹⁸⁸ See *supra* Part IV.B.

¹⁸⁹ See *supra* Part IV.B.

¹⁹⁰ JPO Examination Guidelines, *supra* note 22, Part VII, Chapter 1, at 13.

¹⁹¹ *Diamond v. Diehr*, 450 U.S. 175, 177-78 (1981).

¹⁹² JPO Examination Guidelines, *supra* note 22, Part VII, Chapter 1, at 11.

¹⁹³ *Id.*

Under the proposed standard, software inventions would still be held to a utility requirement. In addition to the U.S. requirement that an invention constitutes patentable subject matter if it is used to create a “useful, concrete and tangible result,”¹⁹⁴ software inventions would have to be applicable to industrial use as defined under Japanese law. These requirements are similar but have been applied slightly differently.¹⁹⁵ Under the proposed standard, software inventions would have to meet both versions of the requirement. This new requirement would include the JPO’s list of inventions that are specifically excluded from patenting because they are by definition not industrial.¹⁹⁶ The combination of the technical idea and industrial use requirements limits patentability by excluding certain inventions such as those with purely personal use and those that do not make use of laws of nature.¹⁹⁷

A. *The Proposed Standard Provides Reasonable Limitations on Business Method Patents*

The proposed standard offers an effective way to re-impose a technology requirement on patentable subject matter. First, it would explicitly restore the requirement that inventions must apply a law of nature in order to be patentable. However, this alone is inadequate because of the difficulty in applying such a requirement. Although a technological requirement would be useful and consistent with the historical understanding of the patent system, it is very difficult to come up with a legally useful definition of technology.¹⁹⁸ This is particularly a challenge with software inventions, since the functioning of software often does not directly depend on laws of nature.¹⁹⁹

The Japanese elaboration on the law of nature requirement provides a useful mechanism for dealing with this challenge. To do so, it provides rules for determining if an invention is technological that are explicit and relatively easy to apply. At the first stage, an examiner merely has to

¹⁹⁴ *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

¹⁹⁵ See, e.g., Furutani, *supra* note 8, at 22-23 (discussing a sample claim that would be allowable under Japanese law but denied patentability in the U.S. because of the requirement that the invention must produce a tangible result).

¹⁹⁶ JPO Examination Guidelines, *supra* note 22, Part II, Chapter 1, at 4-7.

¹⁹⁷ See *id.*

¹⁹⁸ Thomas, *supra* note 172, at 1165.

¹⁹⁹ Software inventions do depend on laws of nature indirectly, since all software causes physical changes in the underlying hardware. However, most software only depends directly on other software. For example, Microsoft Word interacts with the operating system to accomplish tasks, but does not interact with the underlying hardware.

determine whether the software portion of the invention is interacting with physical devices or physical data,²⁰⁰ both of which can be determined easily from the claims. If there is no clear interaction with the physical, the claims can meet the requirements by directly describing the interaction between hardware and software.²⁰¹ Thus, the standard gives clear guidance to examiners. In the same way, it gives clear guidance to applicants so that they know what they have to do to ensure that their invention meets the law of nature requirement.

A particular advantage of adopting the Japanese standard is that, as an existing standard, it has already been tested. The Japanese standard has been applied to deny some of the most controversial business method patents. The JPO denied patents to several famous business methods that were allowed in the United States, such as Priceline.com's reverse auction invention²⁰² and the Japanese version of the patent that was at issue in *State Street*.

In addition, the requirement that inventions be industrially applicable would enforce a form of technological requirement. One proposed definition is that technology is "knowledge that is applied toward material enterprise, guided by an orientation to the external environment and the necessity of design."²⁰³ The Japanese requirement of industrial applicability is very similar to this definition, particularly with its emphasis on interaction with the physical environment.²⁰⁴ This is also consistent with an intuitive understanding of what technology means. Thus, this requirement would pull the patent law back towards a minimum technology requirement. By incorporating the requirement that the invention produce a "useful, concrete and tangible result," the new standard would maintain the existing U.S. requirement.

The proposed standard would also help to improve the quality of business method patents. In part, it would do this by forcing all business method patents to be claimed as software patents. Currently, an examiner searching for prior art on a business method patent has limited options for finding prior art. Since historically companies have preferred to keep business methods as trade secrets,²⁰⁵ examiners have difficulty finding relevant prior art, even for well-known ideas. Applying the proposed

²⁰⁰ See discussion of the Japanese standard, *supra* Part IV.B.

²⁰¹ See discussion of the Japanese standard, *supra* Part IV.B.

²⁰² U.S. Patent No. 5,794,207 (filed Sept. 4, 1996).

²⁰³ Thomas, *supra* note 172, at 1175. Thomas considered the writings of a number of scholars to arrive at this definition. See generally *id.* at 1163-75 (1999).

²⁰⁴ *Id.* at 1180.

²⁰⁵ See *supra* Part V.B.

standard shifts those patents into the field of software, where there is significantly more prior art.

Not only would confining business method patents to their software and hardware implementations make the prior art search easier, it would also limit their applicability to those implementations. The proposed standard limits the scope of the patent to the particular implementation in hardware and software. In so doing, it limits the scope of the patent monopoly and gives competitors more opportunities to design around those limitations. Also, by making it easier to deny patentability based on subject matter, the standard reduces the chances that bad patents will make it through prosecution and later be found invalid in court.

B. At the Same Time, the Proposed Standard Maintains the Benefits of Software Patents

Any proposed change in standards for patentability of business methods should rein in the negative elements of business method patents while maintaining the benefits of software patents. The combined standard proposed here succeeds in doing this by bringing only a few restrictions to software patents as a side effect of putting stronger restrictions on business method patents.

The proposed standard would not affect the decision of the PTO for most software patents, because it short-circuits the evaluation for inventions that use software to control an apparatus or that process data about an object. Manufacturing companies receive the majority of software patents.²⁰⁶ Even in the software industry itself, companies in areas such as graphics and image processing are more likely to obtain patents than companies developing internet software or financial software.²⁰⁷ Inventions patented by manufacturing companies generally use software to control manufacturing processes, so those inventions would automatically be considered patentable subject matter under the proposed standard. Similarly, inventions in the areas of graphics and image processing use physical properties of an object, either for input data or for output, so those inventions would automatically be considered patentable.

In effect, the first part of the law of nature requirement means that the other new restrictions on software patents do not apply to the majority of inventions where patentability is uncontroversial. For example, inventions that use software to control devices have been patentable since *Diehr* and are

²⁰⁶ Bessen and Hunt, *supra* note 120, at 15.

²⁰⁷ Mann, *supra* note 127, at 988.

rarely considered when commentators discuss software patents. More importantly, inventions that use software to control physical objects or that work based on physical properties of the invention are bound in the physical world and cannot be considered business methods. Instead, they use software to assist real-world activities that are already considered patentable. Looked at another way, these inventions use software to perform the exact function that would have been done in hardware in the past. An explicit rule on this subject adds certainty in an area that is not particularly controversial, while applying an additional set of principles to a more difficult question.

A minority of inventions will still be affected by the restrictions, but the limitations are not unreasonable. Software inventors would probably prefer not to have to incorporate hardware into their patent claims. Software engineers tend to design in terms of layers of abstraction so that they can develop programs for an operating system without having to consider the hardware underneath.²⁰⁸ The proposed standard would require them to break through these layers of abstraction in order to write their claims. In addition, incorporating hardware elements into software claims limits the scope of those claims, which could limit inventors' ability to claim infringement at some later time.

However, engineers will still be able to write their claims in such a way that they incorporate software interacting with hardware. That is, in the context of software patents, the rule just requires that patent drafters rethink their view of the invention. It does not require that the drafters rethink the invention.

VII. THE PROPOSED STANDARD WOULD ASSIST EFFORTS TO HARMONIZE PATENT LAWS WORLDWIDE

Moving the United States toward the Japanese standard for patenting software would also benefit efforts to harmonize international patent laws. The inherent benefits of harmonization, including lower costs for inventors and patent offices, are an additional incentive for the United States to adopt the Japanese standard.

²⁰⁸ See Abstraction (Computer Science), http://en.wikipedia.org/wiki/Abstraction_%28computer_science%29 (last visited April 26, 2006).

A. *Progress Toward Patent Law Harmonization Has Sped Up in Recent Years*

Efforts towards patent law harmonization have been fitful in the past, with little progress towards actual harmonization until recent years. Most harmonization negotiations have set minimum levels of protection for patents or have harmonized procedural aspects of patent law. However, in the past decade, countries have made more progress in harmonizing substantive patent law.

Prior to the 1990s, patent treaties focused on setting minimum requirements for patent protection and simplifying procedural formalities. The Paris Convention, which went into effect in 1884,²⁰⁹ set base standards for the patent systems of all signatory countries, including requiring that signatory countries provide the same rights to nationals of other signatory countries as they provide to their own nationals.²¹⁰ The Patent Cooperation Treaty, which went into effect in 1978,²¹¹ supplemented this by simplifying procedural aspects for filing patent applications in multiple countries.²¹² In 1994, the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS") imposed new substantive requirements.²¹³ In particular, it required that all member countries grant patents to "any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application."²¹⁴

The most recent effort on patent law harmonization is the Patent Law Treaty ("PLT"). PLT negotiations began in the 1980s as an attempt to harmonize patent law worldwide, but in the early 1990s the United States decided against further participation.²¹⁵ The U.S. withdrawal stopped progress on the treaty.²¹⁶ Despite its withdrawal from the process, the United States continued to move its system towards harmonization with the rest of the world.²¹⁷ First, it continued to work on other patent-related

²⁰⁹ World Intell. Prop. Org., *WIPO Intellectual Property Handbook: Policy, Law and Use*, WIPO Publication No. 489(E), § 5.7 (2d Ed. 2004), available at <http://www.wipo.int/about-ip/en/iprm/index.htm>.

²¹⁰ *Id.* §§ 5.9-10.

²¹¹ *Id.* § 5.255.

²¹² *Id.* § 5.257.

²¹³ World Trade Org., *Understanding WTO: The Agreements—Intellectual Property: protection and enforcement*, http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm7_e.htm (last visited April 26, 2006).

²¹⁴ Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 27(1), December 15, 1993, 33 I.L.M. 81 (1994).

²¹⁵ Takenaka, *supra* note 178, at 265-66.

²¹⁶ *See id.* at 266.

²¹⁷ *Id.* at 266.

treaties, such as TRIPS.²¹⁸ It eventually continued negotiations on harmonizing the formality and procedural requirements for patent applications, which led to a more limited version of the PLT that went into effect in 2000.²¹⁹ Second, the United States unilaterally changed a number of aspects of its law that were out-of-step with the rest of the world.²²⁰ These changes eliminated many U.S.-only aspects of the law.²²¹ For example, the new law provided for publication of applications eighteen months after filing²²² and allowed inventors to file provisional applications.²²³ The process is continuing, as Congress is currently considering a new patent reform law²²⁴ that will make additional changes to bring U.S. practice in line with the rest of the world, most importantly shifting U.S. law to a first-to-file system for determining priority of invention.²²⁵

Since agreeing on procedural harmonization through the PLT, negotiators have continued work on substantive harmonization with the Substantive Patent Law Treaty.²²⁶ The negotiations have covered elements of substantive patent law such as definitions of prior art²²⁷ and the enablement requirement.²²⁸ In the earlier stages of the negotiations, the treaty did not include a technology requirement in its standard for patentable subject matter.²²⁹ In later sessions, the parties have discussed whether to add a requirement that patentable inventions must be “in all fields of technology,”²³⁰ or whether to leave out that limitation.²³¹ In 2002, the

²¹⁸ *Id.* at 267.

²¹⁹ *Id.* at 267-68.

²²⁰ *Id.* at 268.

²²¹ These changes were primarily implemented in the Uruguay Round Agreements Act, Pub. L. No. 103-465, 108 Stat. 4809 (1994), and the American Inventors Protection Act of 1999, Pub. L. No. 106-113, 113 Stat. 1501 (1999).

²²² Now codified at 35 U.S.C. § 122 (2000 & Supp. 2003). The American Inventors Protection Act of 1999 was passed as part of the Consolidated Appropriations Act, 2000.

²²³ Now codified at 35 U.S.C. § 119(e) (2000 & Supp. 2003).

²²⁴ Currently called the Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005).

²²⁵ *Id.* § 3.

²²⁶ WIPO, Substantive Patent Law Harmonization, <http://www.wipo.int/patent/law/en/harmonization.htm> (last visited April 25, 2006).

²²⁷ WIPO, Standing Comm. on the Law of Patents, *Draft Substantive Patent Law Treaty*, 10th Sess., art. 8, (prepared by the International Bureau), available at http://www.wipo.int/edocs/mdocs/scp/en/scp_10/scp_10_2.pdf [hereinafter *Draft Substantive Patent Law Treaty* (10th Sess.)].

²²⁸ *Id.* art. 10.

²²⁹ Sven J.R. Bostyn, *International Harmonization of the Patent System (I)*, 27 AIPPI J. 310, 316 (2002).

²³⁰ *Draft Substantive Patent Law Treaty* (10th Sess.), *supra* note 227, art. 12.

²³¹ See WIPO, Standing Comm. on the Law of Patents, 7th Sess., *Report*, paras. 159-61, available at http://www.wipo.int/edocs/mdocs/scp/en/scp_7/scp_7_8.pdf [hereinafter *Standing Comm. Report* (7th Sess.)].

negotiators agreed to postpone further consideration of the question,²³² which is where negotiations currently stand.²³³

B. Patent Law Harmonization Brings Significant Benefits to All Stakeholders in the Patent System

The benefits of harmonization significantly outweigh its costs. The most significant cost of harmonization is that it eliminates some of the experimentation that comes from having different standards in different countries. Just as federalism allows U.S. states to experiment with laws to best fit local conditions, so the diversity of patent laws throughout the world may allow countries to tailor their laws to fit local needs. For instance, countries like the United States or Japan, which depend on technology for economic growth, can create strong patents to encourage inventors to advance the state of the art. In contrast, developing countries, which need to adapt to existing technology, may find that their needs are better served by weaker protection.

On the other hand, this loss is heavily outweighed by the benefits of harmonization to inventors and to national patent systems. The most obvious benefit is that harmonization can reduce costs to the applicants.²³⁴ The benefit of substantive patent law harmonization is that applicants will have to do less tailoring to prepare their applications for filing in different countries. Although there will still be the costs associated with translations and the like, harmonization allows applicants to avoid having to significantly change claims and descriptions in each application. In this respect, substantive patent law harmonization is similar to the PCT, which reduced costs for applicants by allowing them to file a single application to claim priority in multiple countries.²³⁵

Harmonization also brings cost savings to the national patent offices.²³⁶ There is a significant shortage of qualified patent examiners worldwide. National patent offices are continually forced to add significant numbers of new examiners.²³⁷ At the same time, the number of patent

²³² WIPO, Standing Comm. on the Law of Patents, 8th Sess., *Report*, para. 294, available at http://www.wipo.int/edocs/mdocs/scp/en/scp_8/scp_8_9-main1.pdf.

²³³ See Draft Substantive Patent Law Treaty (10th Sess.), *supra* note 227, art. 12, n.6.

²³⁴ Bostyn, *supra* note 229, at 311-12.

²³⁵ See discussion of the history of patent law harmonization, *supra* Part VII.A.

²³⁶ Takenaka, *supra* note 178, at 261-62.

²³⁷ See, e.g., *METI to Increase Patent Examiners to Enhance Int'l Competitiveness*, JIJI PRESS TICKER SERVICE, Aug. 25, 2003 (regarding patent examiners in Japan); Kent Hoover, *Patents Applications Still Rising; Patent Office Funding Still in Limbo*, SACRAMENTO BUSINESS JOURNAL, June 15, 2001 (regarding patent examiners in the United States).

applications filed has grown significantly in recent years.²³⁸ In many countries, this increase in applications has stemmed from foreign applicants, as the number of domestic applications has stayed relatively level.²³⁹ Harmonization can help simplify the task of the patent examiners by allowing examiners in different national offices to work together to reduce the costs of searching for prior art.²⁴⁰ A more primitive version of such cooperative effort already exists, in the form of the international search provided by PCT applications. However, greater harmonization would enable national offices to cooperate even more closely. Ultimately, the goal would be for the patent laws to be harmonized to the point that offices would be able to recognize examination results from other offices.²⁴¹

Harmonization can also mitigate the problem of companies that free-ride on patented inventions in countries where those inventions are not patented.²⁴² The concern here is the same one that underlies the patent system. National patent systems were created to protect companies that invest in developing new technologies.²⁴³ A patent on a new technology ensures that the innovating company can capitalize on its invention by preventing competitors from immediately copying the invention and driving the price down.²⁴⁴ If a company doubts that it will be able to get a return on its investment, it will likely choose not to make the investment at all.²⁴⁵ Similarly, when some countries have lower levels of patent protection than others, companies in countries with higher levels of protection will be less likely to invest in an invention because they know that the invention will immediately be copied in countries with a lower level of protection.²⁴⁶ Thus, the citizens of the country with the lower level of protection benefit at the expense of the citizens with the higher level of protection. Substantive harmonization creates minimum standards and helps avoid this type of free-riding.

²³⁸ See, e.g., USPTO, U.S. Patent Activity, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.pdf (last visited October 20, 2006) (showing utility patent activity since 1790).

²³⁹ Mikio Ichikawa, Towards a Global Patent System: the JPO View, Presentation at 2001 CASRIP High Technology Summit Conference, (July 21, 2001), (transcript available at <http://www.law.washington.edu/Casrip/Symposium/Number7/4-Ichikawa.pdf>). A good proxy for this is to look at the statistics for PCT applications, available at http://www.wipo.int/ipstats/en/statistics/patents/pdf/pct_yearly_report.pdf.

²⁴⁰ Ichikawa, *supra* note 239.

²⁴¹ Takenaka, *supra* note 178, at 262-63.

²⁴² Bostyn, *supra* note 229, at 311-12.

²⁴³ See John F. Duffy, *Harmony and Diversity in Global Patent Law*, 17 BERKELEY TECH. L.J. 685, 693-94 (2002).

²⁴⁴ See *id.*

²⁴⁵ *Id.*

²⁴⁶ *Id.*

C. *The Proposed Standard Would Improve the Chances of Harmonizing the Law for Software Patents*

The WIPO group working on the Substantive Patent Law Treaty has reached an impasse on the question of patentable subject matter.²⁴⁷ This stems in large part from the significant differences in standards for business method patents between the United States and other countries, such as Japan.²⁴⁸

The United States could improve the prospects for agreement on harmonization through unilateral action. The United States significantly changed its patent law between the breakdown of PLT negotiations in 1993 and the resumption of negotiations in 2000.²⁴⁹ Changes such as the eighteen month publication requirement and the introduction of the provisional application reduced the differences between U.S. and foreign patent laws and made it easier for the parties to reach compromises to agree on the PLT.²⁵⁰ In fact, that process is continuing, since the latest patent reform efforts will bring the United States even closer to international standards by switching the U.S. system to a first-to-file system and by eliminating the best mode requirement, which is another U.S.-only requirement.²⁵¹

In a similar way, adopting the Japanese standard for patentable subject matter would reduce the differences that treaty negotiators would have to confront in order to reach an agreement on substantive patent law harmonization. The U.S. standard is much looser than the Japanese standard. It is even more generous when compared to the European standard, which specifically excludes patents on “programs for computers.”²⁵² Developing nations also tend to support some form of technology requirement.²⁵³ Since the United States is the outlier, it should be the first to make the change, in order to support the goal of harmonization. Of course, even if the United States adopts the Japanese standard, there will still be significant differences. However, if two of the

²⁴⁷ See *supra* Part VII.A.

²⁴⁸ See Standing Comm. Report (7th Sess.), *supra* note 231, para. 161.

²⁴⁹ See *supra* Part VII.A.

²⁵⁰ See *id.*

²⁵¹ Patent Reform Act of 2005, *supra* note 224. The best mode requirement requires applicants to disclose the best mode for practicing the invention in the application specification. 35 U.S.C. § 112. The United States is the only country that has this requirement.

²⁵² European Patent Convention, Pt. II, ch. 1, art. 52(2)(c). The European standard for patentable subject matter is as complicated as that of the United States and beyond the scope of this comment. However, it is generally considered to be more restrictive of software patents than the standards of either the United States or Japan. See Takenaka, *supra* note 178, at 294-95.

²⁵³ See Standing Comm. Report (7th Sess.), *supra* note 231, para. 159.

three main patent regimes, i.e. the United States and Japan, had the same standard in this area, they could build sufficient momentum to push negotiations forward. In addition, such a concession by the United States in this area would help to encourage progress in other areas of harmonization negotiations.

By adopting the Japanese standard for patenting software and business methods, the United States could help further substantive patent law harmonization. Thus, the advantages for harmonization are another significant reason to adopt the standard.

VIII. CONCLUSION

Since *State Street*, the U.S. courts have set too broad a standard for patenting business methods. The current standard allows useful software patents, but also allows too many patents on pure business methods. These business method patents tend to be of lower quality and are unnecessary to achieve the goal of encouraging innovation in business. In addition, business method patents are inconsistent with the basic understanding that patents should be granted for inventions that are technological. The United States should limit these business method patents by merging its standard for patenting business methods with the Japanese standard. This would limit business method patents while still allowing useful software patents. It would also encourage patent law harmonization by narrowing the differences between the major negotiating countries.