

Texas Intellectual Property Law Journal
Fall 2007

Article

**HARMONIZING THE INTERNATIONAL LAW OF BUSINESS METHOD AND SOFTWARE PATENTS:
FOLLOWING EUROPE'S LEAD**

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*2 I. Introduction

In 1998, the United States (U.S.) Federal Circuit Court of Appeals (CAFC) drastically expanded the scope of patent law¹ to include business methods.² Although casual observers might consider this decision a radical step, it was actually the culmination of a long, logical progression of steps starting from the recognition of patents containing computers and software as components³ to the recognition of software patents independent of any other patentable element,⁴ and finally, to the State Street Bank⁵ recognition of business methods independent of computers and software.

The logic of the court's legal analysis in State Street Bank is difficult to refute. Yet, from a policy standpoint, its implementation has been highly problematic. Historically, algorithms and business methods had not been subject to patent coverage.⁶ However, unlike patent law in Europe and Japan,⁷ U.S. patent law does ***3** not expressly exclude such claims from the scope of patentable subject matter.⁸ As long as the claim covers an invention that is novel, useful, and non-obvious, it is entitled to patent protection under U.S. law.⁹ Today, nearly a decade after State Street Bank endorsed the granting of business method patents, the U.S. Patent and Trademark Office (USPTO) struggles with determining the quality of accepted business method applications and has been criticized for issuing questionable business method patents.¹⁰ On the international front, the two other major patent law regimes, Europe and Japan, which do not recognize business method patents, have attempted to harmonize their business method and software patent law treatment with the U.S. approach. However, policy and legislative constraints have prevented complete convergence.

In this article, we analyze the reasons why the nascent international business method and software patent law harmonization movement has been aborted and we also identify conditions under which business method and software patent law harmonization can become a reality. Our analysis includes an examination of the recent derailment of the E.U.'s patent law harmonization effort and concludes that ***4** the E.U. and non-E.U. European countries are unlikely to adopt the U.S.'s expansive recognition of business method patents. Therefore, a necessary condition for harmonization is for the U.S. to revoke its full recognition of non-computer-implemented business method patents. The USPTO has pushed in this direction by recognizing the importance of limiting the number of business method and software patents through stricter review of patent applications.¹¹ However, without significant, policy-shifting legislative support, judicial precedents in the U.S. will block further convergence.¹² Governed by the judicial mandate to grant patents to "anything under the sun made by man,"¹³ current U.S. patent law stands as an obstacle to a common international treatment of business method and software patents.

In contrast to U.S. experience, policy-based legislation has been the key factor in the development of European and Japanese business method and software patent law. Some interest groups, especially in Europe, would like to see international patent law treatment of business method and software claims move closer to the U.S. approach.¹⁴ However, statutory prohibitions against issuing business method and software patents prevent a full-scale adoption of the U.S. approach. Unwilling to completely repeal the exclusion against the recognition of business method and software patents, Europe and Japan have struggled to interpret statutory exclusions in order to issue patents for innovative computer-implemented claims while continuing to exclude claims whose primary technical innovation is limited to the fact that the process is computer-based. While these often-tortured interpretations¹⁵ have been used to approve a multitude of patents for computer-implemented inventions, they have produced a degree of uncertainty and perceived inconsistencies that are distrusted by proponents and advocates alike.

We start with our review of the state of business method and software patent law in the U.S. and the continuing issues confronting the USPTO in Part II. Part III analyzes European and Japanese developments. Part III also examines the extent to which the three systems have converged in the area of business method and software patent law. Finally, Part IV offers recommendations for increasing the clarity of patent law with respect to business method and software and for *5 harmonizing international business method and software patent law. Such steps are needed not just for harmonization purposes, but also to eliminate social-welfare diminishing characteristics of the U.S. approach. Recognizing that completely revoking the recognition of business method and software patents is likely unattainable,¹⁶ we recommend that the U.S. adopt the stricter European and Japanese inventive step requirement for such patents. Alternatively, should harmonization fail, we recommend creating a sui generis category, which would limit the patent period for business method and software patents. We also agree with Professors Cohen and Lemley that narrowing the scope of business method and software patents while enhancing disclosure requirements for such patents are necessary steps needed to insure that patents foster, rather than impede, innovation.¹⁷

II. U.S. Business Method and Computer-Implemented Patent Law

This Part examines the evolution of U.S. business method and software patent law including a brief review of developments prior and subsequent to State Street Bank's recognition of the patentability of business methods.¹⁸ The first section examines the recognition of software patents as the logical precursor to the recognition of business method patents.¹⁹ The second section reviews the USPTO and Congressional responses to State Street Bank. This Part concludes with a review of the decisions in Bowman²⁰ and Lundgren.²¹

***6 A. Software Patent Law Developments Prior to State Street Bank**

The Patent Act of 1790 provided for the patenting of "any useful art, manufacture, engine, machine, or device, or any improvement therein."²² Over the years, Congress added novelty as an explicit requirement and replaced "art" with "process."²³ The courts, by contrast, were deeply suspicious of process claims fearing that such claims had the potential to expand to cover unprotected natural principles or functional results.²⁴ The perceived problem with patenting functional results, is that the holder of such a patent could conceivably control machines and devices that he had never envisioned and, perhaps, did not have the talents to develop.²⁵ This caution about undue expansion of patent coverage reflects the courts' understanding that the unfettered granting of patent rights would produce anti-competitive results.

The same cautious approach accompanied the beginning of the computer age. In 1966, a presidential commission on the patent system emphatically recommended against extending patent protection to computer programs primarily on pragmatic grounds.²⁶ The Commission used arguments that are still heard today namely that the absence of prior art would make implementing software patents overly burdensome for the USPTO. With respect to the issue of prior art, the Commission reported:

The patent office now cannot examine applications for programs because of a lack of a classification technique and the requisite search files. Even if these were available, reliable searches would not be feasible or economic because of the tremendous volume of prior art being generated. Without this search, the patenting of programs would be tantamount to mere registration and the presumption of validity would be all but nonexistent.²⁷ Moreover, the Commission concluded that copyright law already provided protection for software, and that the software industry was flourishing without patent-based incentives.²⁸ Nonetheless, Congress took no action to limit the scope *7 of patent protection in the area of software and computer-implemented innovations.²⁹

Starting with the Circuit Court for Patent Appeals (CCPA) in the 1960s, the courts have rejected pragmatic considerations and gradually eliminated the restrictions on software patents. In the 1969 case of *In re Prater*, the CCPA ruled that a machine-implemented process could be statutory under certain narrow conditions.³⁰ In 1972, the Supreme Court rejected this argument asserting that the key to patentability of a computer-implemented invention was a physical transformation from one state to another.³¹ In its 1982 *Diamond v. Diehr* decision, the Supreme Court extended this argument to cover mathematical formulas and algorithms provided they are employed in a process that includes a physical transformation as a result.³² In its 1994 decision, *In re Alappat*, the CAFC weakened the physical transformation requirement by opting instead to define statutory subject matter by whether the program produces "a useful, concrete, and tangible result."³³ Commentators interpret

this requirement to mean that while there does not need to be a physical transformation, the claimed invention needs to employ a machine or apparatus of some sort.³⁴

It was not long thereafter that the CAFC eliminated this last vestige of a requirement for a physical or tangible result. First, in *State Street Bank*, the CAFC rejected the business method exception to statutory matter and concluded that mathematical algorithms are non-statutory only when they are shown to be abstract ideas devoid of a useful purpose.³⁵ However, the court did not completely embrace abstract business methods as patentable subject matter. Instead, the court considered the application of mathematical algorithms to transform data using a machine to produce a concrete and tangible result critical to the patentability determination.³⁶ A year later, the CAFC in *AT&T Corp. v. Excel Communications, Inc.*³⁷ eliminated the “machine” requirement altogether. In this later case, the *8 business method claim employed mathematical algorithms without an associated machine or apparatus.³⁸ Nonetheless, the court held that a method of applying a mathematical algorithm constitutes patentable subject matter, regardless of whether its application requires the use of a machine or computer, as long as it produces a useful, concrete, and tangible result.³⁹ Thus, over the USPTO’s protests and without consideration of pragmatic imperatives, the courts, relying solely on legal reasoning, eliminated all restrictions to the patenting of business methods.

B. USPTO and Congressional Responses to the Patentability of Business Methods

Following the U.S. courts’ recognition of business method patents, the USPTO had difficulty responding to the dramatic increase in patent applications.⁴⁰ The absence of a database covering prior art for business methods left the USPTO ill-equipped to rule on business method patent claims. These difficulties resulted in its granting patents for claims that many commentators believed did not deserve patent protection.⁴¹ Specifically, the criticism centered upon the issuance of patents for overly broad business methods that did not meet the twin patentability thresholds of novelty and non-obviousness.⁴²

The proliferation of business method patents created additional problems. Many companies were slow to understand the implication of business method patentability. Prior to *State Street Bank*, many companies never thought to patent innovations in business methods. Regardless of their reasons, companies that *9 continued to use business methods that had become subject to patent protection were vulnerable to patent infringement claims by parties who subsequently obtained patents covering these business methods. Congress interceded to help remediate the risk of such harm. The American Inventor’s Protection Act (AIPA) provided an affirmative defense to business method patent infringement claims.⁴³ In order to receive protection under the AIPA, a defendant must prove that she had developed a business method in good faith at least one year prior to the filing of a business method patent claim and had commercially used the invention prior to the patent filing.⁴⁴ Instead of implementing a policy to restrict and narrowly define the areas for which the USPTO could issue business method patents, Congress instead chose to address only some of the implications of granting such patents.⁴⁵

1. USPTO and Board of Patent Appeal’s Responses

Congress showed little interest in overruling the judiciary by addressing the practical problems that *State Street Bank*’s broad expansion of patent coverage created.⁴⁶ The USPTO responded by implementing the Business Method Patent Initiative: An Action Plan.⁴⁷ As a result, the number of Class 705 (business method) patents issued was drastically reduced.⁴⁸ The “Action Plan” was merely a process-directed response that made it more likely for such claims to meet the threshold of a “useful, concrete, and tangible result.”⁴⁹

*10 The Board of Patent Appeals (BPA) also attempted to rein in patent coverage of business methods. In *Ex parte Bowman*, the BPA reviewed an appeal of an examiner’s rejection of a claim for a method for creating a chart and plotting points thereon.⁵⁰ In defending his invention, the appellant attempted to tie his claim to the USPTO’s guidelines.⁵¹ However, the examiner and the BPA rejected this effort because nothing in the claims suggested that computers were required to practice the invention. Instead, the BPA concluded that the invention was merely an abstract idea that was not statutory subject matter and was obvious to someone of ordinary skill in the art.⁵² While this conclusion would have easily disposed of the immediate appeal, the BPA explained its conclusion by asserting that the claimed invention was non-statutory because it was not tied to a “technological art.” They asserted that the term “technological arts” was a synonym for “useful arts,” the term used in the U.S. Constitution.⁵³

Thus, the BPA created a requirement that business method patent claims be computer-implemented. The decision completely ignored the precedent established by the *Diamond-Alappat-State Street Bank* line of legal rulings, which minimally required

that a patent meet only the generic requirements of novelty, non-obviousness, and utility with no additional requirement that the invention advance the technical arts.⁵⁴ Some commentators believe this decision was an intentional attempt to rein in the broad mandate of *State Street Bank* and prior court precedents.⁵⁵ The inclusion of the technical arts threshold excluded almost all non-computer-implemented business methods from statutory subject matter. It also served to move U.S. patent law toward harmonization with European and Japanese patent law by focusing on the technical aspects of computer-related business method inventions.⁵⁶ Both European and Japanese patent laws require, *inter alia*, computer-implementation for patentability and do not consider pure or “naked” business methods patentable.⁵⁷

*11 2. Lundgren and Beyond: What *Bowman* Taketh Away, Lundgren Giveth Back

The 2005 BPA decision, *Ex parte Lundgren*, rejected the international trend towards requiring a minimal technical advancement or contribution for the patentability of business methods.⁵⁸ In reviewing an appeal from the rejection of a claim for a method of determining incentive-based managerial compensation based on performance standards, the BPA addressed the narrow question of whether the claim covered statutory subject matter. Instead of relying on *Bowman*, the Lundgren Board looked to Section 101 of the Patent Act for guidance.⁵⁹ In reiterating that Section 101 only requires inventions to be new and useful, the BPA noted that the Supreme Court had previously excluded “nature, natural phenomena, and abstract ideas” from statutory subject matter.⁶⁰ The BPA then affirmed that there were no other exclusions from statutory subject matter and rejected the notion that a patent claimant had to satisfy a “technological arts” requirement.⁶¹ It reasoned that there was no workable definition of technical or technology. The decision, therefore, rejected the “technological arts” patentability test promulgated in *Bowman*.⁶² The Board determined that the subject matter test for patentability merely requires that a process claim “produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, [and] on its face comfortably falls within the scope of § 101.”⁶³

3. The Probability of Supreme Court Intervention

The Lundgren decision eliminated the potential for the USPTO to place non-Congressionally-mandated limits on the patentability of business methods. In Lundgren, the BPA retreated from its *Bowman* decision, realizing that there was no authoritative support for unilaterally reinterpreting the definition of statutory subject matter. Clearly, any effort to harmonize U.S. business method and software patent law with the international trend will not originate inside the USPTO. In the *12 absence of Congressional intent to address this issue, some commentators are holding out hope that the Supreme Court will supply guidance.⁶⁴

This hope is drawn from two cases. The Court’s 2006 *eBay, Inc. v. MercExchange, L.L.C.*⁶⁵ decision suggests that some members of the Supreme Court have significant concerns about business method patents.⁶⁶ Justice Kennedy’s concurring opinion, joined in by Justices Stevens, Souter, and Breyer, voiced concern about granting permanent injunctive relief in business method patent infringement cases because of “the potential vagueness and suspect validity of these patents.”⁶⁷ The best hope for judicial action in the business method patent area is, perhaps, *LabCorp v. Metabolite Laboratories*.⁶⁸ In this extraordinary case, the Supreme Court granted certiorari and then withdrew the grant of certiorari for technical reasons.⁶⁹ Despite the withdrawal of certiorari, the case could return to the Supreme Court and provide the justices with an opportunity to modify the U.S. treatment of business method patents. In *LabCorp v. Metabolite* held a patent on various claims regarding the association between high blood levels of homocysteine and vitamin B12 and folic acid deficiencies. The patent claim that the Supreme Court initially accepted for review concerned using high homocysteine blood levels as an indicator or test for the previously mentioned deficiencies.⁷⁰ *LabCorp* filed for certiorari asserting that the relationship between an amino acid and a vitamin deficiency cannot be statutory subject matter because the claimed correlation is a basic scientific relationship or discovery, not an invention.⁷¹

Justices Breyer, Stevens, and Souter’s dissent from the decision to withdraw certiorari may foreshadow future Supreme Court thinking. These Justices would have decided the case on its merits. Justice Breyer considered the case an easy one, arguing that the process claim clearly covered a natural phenomenon not subject to patent protection.⁷² Tellingly, he then argued that *State Street Bank* could not be relied on because it is not a Supreme Court decision.⁷³ He rejected *State Street Bank*’s “useful, concrete, and tangible result” test for patentability because “if taken literally, the statement would cover instances where this Court has held to the contrary.”⁷⁴ These three Justices would have invalidated the patent.

LabCorp holds out the possibility for a rejection or a narrowing of *State Street Bank* due to the Justices’ concern about the breadth of business method patents. However, we can only speculate on the nature of likely changes. The Supreme Court could reiterate the standard it established in its last relevant decision, *Diamond v. Diehr*.⁷⁵ The Supreme Court in *Diamond v.*

Diehr required a physical transformation to occur in order for a process to be eligible for patent protection.⁷⁶ This requirement implicitly rules out all non-computer-implemented business method inventions. However, following the Diamond decision would likely eliminate many software inventions from the definition of statutory subject matter because they often lack a physical change component. It is doubtful that the Supreme Court would take such a radical step.

Alternatively, the Supreme Court could modify the “physical transformation” requirement to allow some software patents, while still removing business methods from statutory subject matter. For example, the Court could replace the “physical transformation” requirement for patentable subject matter with a “physical transformation or transformation perceivable by one of the five senses” requirement. Employing this test, software that manipulates images or sounds alarms would be considered statutory subject matter. Finally, the Supreme Court could adopt the technological arts requirement proposed in Bowman or the “inventive step” requirement found in some foreign patent laws. This next Part examines the two most significant foreign patent law systems, Europe and Japan, and their different approaches to business method and software patents.

III. European and Japanese Responses

A dichotomy between patentability in law versus practical expediency has characterized the response of European countries and the E.U. to the U.S. recognition of business method and software patents. In substantive law, Europe rejects recognition of business method patentability and significantly limits software patentability. In practice, the European Patent Office (EPO) has followed a much more difficult, perhaps even tortured, path in distinguishing between patentable, innovative computer-implemented inventions and unpatentable software and business methods.⁷⁷ The Japanese Patent Office’s (JPO) path to increased *14 recognition of the patentability of business method and software patents has been far less contentious. However, in neither case is there indication that these countries will duplicate the extremely liberal recognition of business method and software patents that exists in the U.S.

A. European Patent Law

Previously, we predicted a relatively quick convergence of the three major patent law systems in recognizing the patentability of business method and software inventions.⁷⁸ We predicted that the U.S. expansion of the scope of patentability would force the E.U. and Japan to fall in line with the U.S. standard. For one, the benefits of harmonization of intellectual property law are widely accepted (often with formal treaties enacted to expedite harmonization).⁷⁹ Added to that, market forces would pressure the Trilateral Patent System to avoid allowing any single member to maintain a competitive advantage due to differences in patent law. With estimates upwards of 40,000 business method and software patents having already been granted in Europe,⁸⁰ it seemed only a matter of time before Europe completed its convergence to the U.S. system through legislation. However, in 2005 the E.U. soundly rejected an effort to expand business method and software patent coverage.⁸¹ The remainder of this section addresses the question of why European patent law failed to converge to the U.S. approach and prospects for future convergence in Europe.

1. History of E.U. Patent Law

The genesis of the integration of European patent law can be traced to the 1883 Paris Convention for the Protection of Industrial Property (Paris *15 Convention).⁸² While it did not harmonize patent law, the Paris Convention did establish the doctrine of “national treatment,” which requires all member states to provide citizens of other member states with the same treatment as their own when dealing with patents.⁸³ National treatment does not require a country to recognize foreign patents that would not qualify for patent recognition if applied for domestically.⁸⁴ Therefore, if France does not recognize a type of patent (for example, business methods) it has no obligation to recognize that type of patent issued by a sister state. Therefore, European countries remained without an integrated patent system even after the Paris Convention.

The first true attempts at European patent law integration occurred in the 1930s and 1940s.⁸⁵ These efforts continued through the 1950s and 1960s and culminated with the adoption in 1970 of the Patent Cooperation Treaty (PCT).⁸⁶ The PCT attempted to not only integrate European patent law, but to also harmonize European patent law with U.S. law.⁸⁷ However, in as much as European patent law was yet to be harmonized, the dream of harmonization with the U.S. remained a distant goal.

There were many conflicting patent traditions among European countries. Two of the strongest patent traditions that needed

reconciliation were those of Germany and the United Kingdom.⁸⁸ In Germany, inventions were entitled to protection if they included a “technical effect.”⁸⁹ In the United Kingdom, inventions were entitled to patent protection if they were, novel, useful and subject to an “inventive step.”⁹⁰ While the distinction between the two approaches is rather subtle, some commentators consider the distinction to be a one-step evaluation of the nature of invention in the German approach versus the application of multiple measures or requirements in the U.K. approach.⁹¹

Harmonization efforts began in earnest again during the 1950s and picked up momentum towards the end of the 1960s. Proponents seemed to recognize the futility of trying to completely harmonize patent law throughout Europe, which consisted of the European Economic Community (EEC), the predecessor of the E.U., and non-EEC members.⁹² The plan eventually adopted included the *16 establishment of the European Patent Office (EPO). Contracting countries to the Convention on the Grant of European Patents (EPC)⁹³ consist of both E.U. member states and non-E.U. European countries. The EPO has patent prosecution responsibilities based on the rules, procedures, and standards adopted by all members of the EPC.

The EPC streamlines the patent prosecution process, but does not supplant existing patent laws in contracting countries. Rather, the EPC created an additional layer of bureaucracy that coexists with each member country’s existing patent prosecution and review system.⁹⁴ An applicant can file with the EPO or in individual European countries.⁹⁵ However, a filing with the EPO constitutes a filing in each designated European country and, with one exception, has legal status equal to that of a patent filed within each designated country.⁹⁶ In addition to prosecution of patent applications, the EPO is also responsible for patent opposition proceedings. Within nine months after the EPO grants a patent, third parties may challenge the validity of the patent for failing to satisfy EPC Article 52 patentability requirements.⁹⁷ The EPO can decide to maintain the granted patent, maintain the patent in amended form, or revoke the patent.⁹⁸ The outcome of the opposition process can then be appealed to the EPO Boards of Appeal.⁹⁹

In the absence of a true European patent, the ad hoc EPO Boards of Appeal occupy curious positions. The Boards of Appeal accept appeals from actions originating from EPO divisions.¹⁰⁰ Since the EPO’s primary functions are the review and prosecution of patent applications, the Boards of Appeal decisions deal primarily with procedural issues and questions of patent validity.¹⁰¹ Decisions by the Boards of Appeal are not precedents and are therefore not binding on contracting states.¹⁰² In the event of a conflict between Boards of Appeal decisions, the EPO can convene an Enlarged Board of Appeal to establish *17 uniformity in the application of EPC law.¹⁰³ While these decisions are binding on EPO Boards of Appeal, they are merely “persuasive, not prescriptive” with respect to contracting states.¹⁰⁴ Therefore, there is the potential for significant conflicts between EPO decisions and those of contracting states with respect to patentability.

2. European Treatment of Business Method and Software Patents

Conflicts and controversy have surrounded the European treatment of business method and software patents. The EPC states that all inventions “which are susceptible of industrial application, which are new and which involve an inventive step” shall be granted a European patent.¹⁰⁵ The EPC then excludes certain innovations from the category of patentable subject matter.¹⁰⁶ Many of these exclusions correspond to exceptions recognized under U.S. law such as scientific discoveries and mathematical algorithms.¹⁰⁷ However, the EPC diverges dramatically from U.S. law by explicitly excluding “schemes, rules and methods for . . . doing business, and programs for computers.”¹⁰⁸ Despite the apparent plain meaning of these exclusions, EPC Article 52(3) introduces ambiguity by limiting the exclusion “only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.”¹⁰⁹ The “as such” clause has allowed the EPO to accept patent applications that appear to be excluded as business methods or computer software inventions. While the EPO has successfully employed the EPC’s exclusions to avoid patenting most stand-alone business methods, they have been able to issue thousands of computer-related business method and software patents.¹¹⁰

While this large estimate of successful patent claims may suggest that Europe is converging to the U.S. standard, a review of EPO Boards of Appeal business method and software patent decisions suggests that the convergence is far from complete. While there is no explicit requirement in the EPC for technical character or a “technical contribution,” the patent courts initially interpreted the EPC as including such a requirement. VICOM¹¹¹ was one of the first Boards of Appeal *18 cases to consider software patents. The VICOM patent application covered a method for digitally processing images stored in a digital format.¹¹² In this format, images are represented as an information matrix that is subject to mathematical operations.¹¹³ These operations, which are familiar to anyone conversant in image filtering and the application of linear mathematics, are used for smoothing, sharpening, and other image processing functions.¹¹⁴ In its review, the EPO Examining Division rejected several VICOM claims because they related to unpatentable mathematical methods.¹¹⁵ The division reasoned that these operations, which are mathematical in nature, were not of a technical character because they were essentially mathematical

manipulations.¹¹⁶

The Board of Appeal, employing a technical contributions test, rejected this conclusion by distinguishing a general “method for digitally filtering data,” which Article 52 would bar, and a specific application of the method to, for example, enhance images.¹¹⁷ This method of applying mathematical algorithms to a perceptible object produces an objectively enhanced image. Thus, the application of math to a perceptible object resulting in a perceptibly different object constitutes a technical contribution. Even though the calculations that produced the output could be done by hand or by any standard computer or calculator, the alteration of a physical object was determinative.¹¹⁸ The Board of Appeal was further comforted by the patent’s employment of the mathematical method in a limited application. The Board reasoned that the specialized use would not preclude others from using these mathematical methods in a different application and would be a technical process susceptible of industrial application.¹¹⁹ Thus, if the incremental contribution to the prior art was technical in nature, the technical character requirement for patentability would be satisfied.

In addition to a perceived or physical transformation, an EPO Board of Appeal found technical contributions when methods were encapsulated in other than generic computer equipment. For example, in *Queueing System*, the Board of Appeal had no trouble identifying a technical contribution in a software-based system that assigned priority to customers located at multiple service points.¹²⁰ The system not only identified and assigned priority, a data processing function, but it *19 also sent messages to the various service points signaling the availability of the service.¹²¹ The fact that the software was merely a component of a larger electronic system that included a three-dimensional object or apparatus was enough for the claim to escape the Article 52 exclusions.¹²² The Board of Appeal emphasized the importance of not conflating the Article 52 patentability requirements with the Article 56 inventive step requirement.¹²³ For this Board, the inventive step requirement was equivalent to the non-obviousness requirement found in Section 103 of the U.S. Patent Code.¹²⁴ The Board of Appeal emphasized that the EPO examiners must first consider whether Article 52 excludes the claim from patent consideration.¹²⁵ If not, the claim’s subject matter is patentable. The EPO then must consider whether the claim passes the Article 56 obviousness test.¹²⁶ Applying the second half of this two-part test, the Board of Appeal in *Queueing System* concluded that the complexity of implementing the queueing system electronically was not obvious to someone skilled in the art.¹²⁷ Therefore, the claim survived both the Articles 52 and 56 tests.¹²⁸

The technical contribution requirement, while intuitively satisfying, did not provide a clear delineation between patentable software and non-patentable software. The *VICOM* case, while characterized as a physical manipulation, was in reality a data processing method. Its most significant advance over previous methods was speed.¹²⁹ Similarly, the major distinction between the disputed claim in *Queueing System* and a pure business method was that the invention in *Queueing System* was inseparable from the included apparatus.¹³⁰ The integrated nature of the claim, which utilized input from customers, computer-based analysis and subsequent visual signals directing customers without human intervention, persuaded the court that a technical innovation existed.¹³¹ This process could not be separated from the included apparatus and “interpreted as a method for doing business as such.”¹³² This reasoning raises the question of what degree software or *20 a business method must be embodied in an electronic apparatus for an invention to pass the Article 52 patentability test.

The lack of a definitively drawn line continued to be a problem for the EPO. In the 2000 *Pension Benefit Systems*¹³³ decision, an EPO Board of Appeal struggled with the technical character requirement. The case involved a method for calculating pension benefits using a computing apparatus. The EPO rejected the initial application as a business method excluded under Article 52.¹³⁴ On appeal, the claimant asserted, among other things, that the pension system was similar to the previously patented *Queueing System* claim by also employing an apparatus.¹³⁵ The *Pension Benefit Systems* Board of Appeal disposed of the appeal summarily by concluding that the claim was for a purely economic innovation.¹³⁶ Furthermore, the Board of Appeal maintained that “methods only involving economic concepts and practices of doing business are not inventions within the meaning of Article 52(1) [of the] EPC.”¹³⁷ Applying a method through the use of a computer or other apparatus does not change the essential nature of the claim, nor does it endow a “purely non-technical purpose” with a technical character.¹³⁸

While the above analysis should have disposed of the matter, the *Pension Benefit Systems* Board of Appeal opted, instead, to revisit the technical contribution test. They appeared to be troubled by: (1) the absence of a solid definition for technical character and (2) the inescapable logic that a business method or software-based method embodied in a computer or electronic apparatus does indeed have a technical character. In a full retreat from the technical contribution requirement, the Board concluded that Article 52(1) of the EPC does not exclude any concrete apparatus embodying software or a business method.¹³⁹

To escape this quandary, the Board of Appeal took a different approach. Rather than apply the technical contribution test, it

opted instead to decide the case based on the Article 56 inventive step requirement. The Board posed the question: What is the prior art to which the claim contributes? In this case, the relevant prior art was all prior pension plans.¹⁴⁰ However, since pension plans fall entirely within the fields of business and economics, there could be no inventive step or contribution of a technical character because such fields are excluded from patentability.¹⁴¹ Therefore, the Board of Appeal avoided the conundrum of *21 determining when a claim is of technical character by asserting that any claim embodied in a physical computer or apparatus is of a technical character.¹⁴² Instead, the Board relocated the issue of technical contribution to the determination of inventive step. Thus, after Pension Benefit Systems, the EPO Boards of Appeal abandoned the technical contribution test in favor of interpreting the inventive step requirement to be satisfied only for inventions with a technical character.

At the national level, the U.K. High Court of Justice recognized the difficulty of distinguishing inventions with technical character from inventions without technical character. In CFPH Applications,¹⁴³ the court attempted to reconcile the EPO Boards of Appeal's abandonment of the technical contribution test still employed by most European patent courts. In CFPH Applications, Judge Prescott was both troubled by the EPO Board of Appeal's somewhat cavalier desertion of the technical contribution test and sympathetic to its motivation for adopting a new test.¹⁴⁴ In his decision, Judge Prescott noted that the EPC Article 52 exclusions were based on, at times, inconsistent or contradictory policy reasons.¹⁴⁵ He noted that prior to the U.S. allowing software patents, programmers had adequate incentives to produce innovations in software; therefore, software patents served no valid public policy purpose.¹⁴⁶ The rationale for excluding business method patents was similar in that businesses have always innovated without patent-generated incentives. Therefore, given that patents are anti-competitive by nature, the European policy has been to presume that the benefits of providing patent protection for business methods were outweighed by their anti-competitive effect on commerce.¹⁴⁷

The problem with the technical contribution test is its focus on the Article 52 exclusions and the nebulous technical character requirement. While Judge Prescott agreed with the need for change, he did not embrace the EPO Board of Appeal's decision to move the technical character analysis from the scope of Article 52 to the inventive step analysis of Article 56.¹⁴⁸ Instead, Judge Prescott thought that a better approach was to make technical character an implicit rather than explicit component of the patentability determination.¹⁴⁹ Noting that the controversy deals *22 exclusively with computer-based and software-based patents, Judge Prescott agreed with the EPO that the initial focus should be on the "new and non-obvious" component of the inventive step requirement.¹⁵⁰ Examiners should ask whether the claim is new and non-obvious "merely because there is a computer program [included in the claim] . . . [o]r would it still be new and non-obvious in principle even if the same decisions and commands could somehow be taken and issued by a little man at a control panel, operating under the same rules?"¹⁵¹

This framing cleverly avoided dealing with the technical character issue. For example, the Prescott analysis would have quickly disposed of the U.S. Amazon.com "one-click" case in which Amazon.com attempted to enforce a patent for an internet-based purchasing system that consummates a purchase with just one website-based action on the part of the consumer.¹⁵² In the actual case, the CAFC rejected Amazon.com's request for a preliminary injunction because the patent likely lacked validity.¹⁵³ Under Judge Prescott's approach, the first step would be to ask whether Amazon.com's invention is new and non-obvious. If the invention lacks novelty or is obvious, the patent claim would immediately be rejected. If the Amazon.com claim survived this step, the patent examiner would then ask whether the claim is new and non-obvious independent of the Internet software application. The one-click process could indeed be run independent of its computer application: An Amazon.com representative who takes an order from a customer looks up the customer's credit card and shipping information and completes the transaction with no further input from the customer. Since there is nothing new and non-obvious about this transaction removed from the Internet context it would likely fail Judge Prescott's analysis.

Application of other patentability criteria would likely produce similar results. Under the older Boards of Appeal's technical contribution test, the examiner would likely conclude that the claim is excluded under Article 52(2) as a business method.¹⁵⁴ However, the examiner would likely get bogged down in explaining why there is no technical contribution given the sophisticated programming employed to implement the one-click process. Under the revised Boards of Appeal analysis, the examiner would ask what prior art Amazon.com's claim advances? Because the software, while sophisticated, was neither special nor innovative, the examiner would likely conclude that any new and non-obvious claim attribute falls in the area of business and commerce.¹⁵⁵ Since these areas are not entitled to patent protection, the examiner would be forced to disallow the claim as outside the purview of Article 52.

*23 In sum, the reasons behind the three approaches--the Prescott analysis, the technical contribution analysis based on Article 52, and the Boards of Appeal reformulation--are different but in a substantial majority of patent claims the outcome

would be identical. The major difference between the three tests is the relative clarity of analysis. The original technical contribution test was murky due to its inability to delineate between patentable and non-patentable software innovations. The Boards of Appeal reformulation removed much of the ambiguity by eliminating the technical contribution test and the need to debate the existence of technical character. However, the reformulation is susceptible to criticism because it requires the examiner to subjectively determine whether the claim's contribution to the prior art lies in a technical area or in an area excluded by Article 52. Judge Prescott's CFPH Applications approach, while imperfect, provides a more objective analysis by asking whether the invention would be patentable, new and non-obvious, if it were hypothetically practiced independent of its computer implementation.

3. Recent E.U. Legislative Efforts

The inability of the EPO to develop a concrete, unambiguous treatment of business method and software patent claims has been heavily criticized. The European Economic and Social Committee, a group comprised primarily of industry representatives, decried the EPO's approach to software patents as "the product of legal casuistry."¹⁵⁶ The proposed E.U. directive on the patentability of computer-implemented inventions criticized the EPO's "lack of clarity" as "an important negative influence on the [software] industry."¹⁵⁷ The Proposed Directive claimed that software patents had promoted growth of U.S. computer-related industries and that allowing European business method and software patents would aid European producers by creating "a level playing field."¹⁵⁸ By contrast, the open source community, committed to open development and free distribution of software, fear that full recognition of software patents will allow large software developers to erect access barriers to huge segments of the software industry.¹⁵⁹ Included in this opposition group are socialists who believe that efforts to reform software patent law are designed to benefit companies like Microsoft to the *24 disadvantage of small businesses.¹⁶⁰ With this backdrop, it is not surprising that software patent reform has been a difficult undertaking in Europe.

In 2002, the E.C. initiated a proposal for an E.U. directive on software patents.¹⁶¹ The E.C. considered a broad range of options, including abolishing the Article 52 computer program patent exclusion.¹⁶² However, perhaps anticipating strong opposition, the E.C. framed their approach as patent law harmonization.¹⁶³ They acknowledged that only two E.U. member states, Germany and the U.K., had any significant software-patent-law jurisprudence, but asserted that there already were conflicts between the laws of these two nations and that they anticipated further divergence.¹⁶⁴ To support its assertions, the E.C. claimed that under German law, business methods could be patented even if there was no technical contribution.¹⁶⁵ By contrast, under U.K. patent law, business method could not be patented even if the claim contained a technical contribution.¹⁶⁶ Both these assertions proved to be false. The Proposed Directive subsequently revealed that the German Bundesgerichtshof denied that its approach was that lax, but affirmed that its approach was consistent with that of the EPO.¹⁶⁷ Similarly, the U.K. approach outlined in CFPH Applications is more similar to the flexible EPO approach to business methods than the rigid prohibition described in the Proposed Directive.¹⁶⁸

Pursuant to Article 95 of the Treaty Establishing the European Community,¹⁶⁹ the E.C. introduced the Proposed Directive for review and passage by the European Parliament and European Council.¹⁷⁰ The stated goal of the Proposed Directive was to tie E.U. treatment of computer-implemented patent claims closely to the then current EPO treatment of such claims¹⁷¹ as expressed by the EPO Boards of Appeal decisions in *Pension Benefit Systems*¹⁷² and *Koch & Sterzel, T-0026/86 (1987)*.¹⁷³ However, *Pension Benefits Systems* explicitly rejected the technical *25 contribution test employed in earlier cases.¹⁷⁴ Therefore, the Proposed Directive's embrace of a technical contribution test was actually a rejection of recent Boards of Appeal case law.

Consistent with *Pension Benefit Systems*' inventive-step focus, Proposed Directive Article 4(1) would require member states to recognize patent claims involving computer-implemented inventions only if the invention "is susceptible of industrial application, is new and involves an inventive step."¹⁷⁵ However, the Proposed Directive departs from *Pension Benefit Systems* by making technical contribution a patentability requirement even though *Pension Benefit Systems* explicitly abandoned that approach. Proposed Directive Article 4(2) further states that a necessary condition for the existence of an inventive step is that, "a computer-implemented invention must make a technical contribution."¹⁷⁶ Proposed Directive Article 4(3) directs member states to determine technical contribution by "consideration of the difference between the scope of the patent claim considered as a whole, elements of which may comprise both technical and non-technical features, and the state of the art."¹⁷⁷

Proposed Directive Article 4(3) was either the product of a misreading of *Pension Benefit Systems* or a not-so-subtle attempt to expand the coverage of E.U. computer-implemented patent law beyond what the EPO allowed. The Proposed Directive Article 4(3) mandate to consider the patent claim as a whole was indeed drawn from similar language in the *Pension Benefit*

Systems approach.¹⁷⁸ However, the relevant reference was a quote of EPO guidelines and it came immediately after the EPO Board of Appeal concluded that the technical contribution approach was not an appropriate method for determining whether a claim constituted a patentable invention with respect to EPC Article 52.¹⁷⁹ The purpose of the Board of Appeal reference was to illustrate how the technical contribution requirement confused “the requirement of ‘invention’ with the requirements of ‘novelty’ and ‘inventive step.’”¹⁸⁰ Thus, the case law support that ostensibly provided the basis for the Proposed Directive was, in reality, an emphatic rejection of the technical contribution approach adopted in the Proposed Directive.

***26** The deviation of the Proposed Directive language from the EPO Boards of Appeal’s approach in Pension Benefit Systems would allow an expansion of computer-implemented patent coverage into areas that would not qualify under existing Boards of Appeal analysis. The Proposed Directive would allow patent grants for business methods claims for which “a non-obvious technical contribution [was] present.”¹⁸¹ According to the E.C., Proposed Directive Article 4(3) would, however, exclude business method claims that contained no technical contribution whatsoever.¹⁸² The E.C. offered assurances that any patents granted for business methods and other non-qualifying subject matter would not be recognized independent of the technical contribution that enabled the business method to obtain patent coverage.¹⁸³ Thus, the Proposed Directive would exclude many of the non-technical U.S.-styled business method patents, but not all of them.

The difference between the Proposed Directive’s approach and those of the EPO and U.K. is best illustrated with an example. Applying Proposed Directive Article 4 to a claim for a new accounting system implemented by a computer-based system in a new and non-obvious way would likely result in a patent grant under both U.S. patent law and the Proposed Directive. Since implementation of the accounting system is new and non-obvious, it would satisfy the “new” and “industrial application” requirements of Proposed Directive Article 4(1). In addition, the claim or invention would need to satisfy the Proposed Directive Article 4(2) requirement for an inventive step, which requires the invention to make a technical contribution. In assessing technical contribution, Proposed Directive Article 4(3) requires consideration of the claim as a whole, without distinguishing between technical and non-technical elements. Employing this test, the examiner would have to conclude that there is a technical contribution relative to the prior art because, judged as a whole, the invention has a technical character. It is an advance over the prior art, and therefore, makes a technical contribution.¹⁸⁴

This analysis differs significantly from the test proposed in Pension Benefit Systems. The Pension Benefit Systems test requires examining the computer-implemented accounting system for an inventive step.¹⁸⁵ It first identifies the relevant prior art to which the claim contributes. In this example, even though the accounting system is computer-implemented, the examiner would almost certainly conclude that the relevant contribution is to business, economics, or accounting. It would be difficult to identify a technical area that is advanced by this claim, so the ***27** EPO would reject it.¹⁸⁶ The result would also diverge from the Proposed Directive standard under the U.K. approach espoused in CFPH Applications. This approach requires the court to ask whether the accounting system is new and non-obvious “even if the same decisions and commands could somehow be taken and issued by a little man at a control panel.”¹⁸⁷ Since the claim is simply the implementation of an accounting system, it could be implemented by the “little man” in a control booth. Therefore, the claim would not incorporate an inventive step because the innovation does not require a computer or anything else of a technical character and, consequently, would not be patentable. Therefore, rather than simply harmonizing European software patent law based on Pension Benefit Systems, the Proposed Directive would significantly increase the scope of business method and software patentability in the E.U. beyond prior case law.

The European Parliament, with the support of many in the open-source software industry,¹⁸⁸ rejected the Proposed Directive and offered in its place a set of amendments that significantly limited the patentability of computer-implemented inventions.¹⁸⁹ The Amended Proposed Directive, while leaving much of Proposed Directive Article 4 unchanged, limited the patentability of computer-implemented inventions by allowing patents only for inventions that make contributions in technical fields. Technical fields include “the use of natural forces to control physical effects beyond the digital representation of information.”¹⁹⁰ Amended Proposed Directive Article 2b explicitly excludes “the processing, handling, and presentation of information” from technical field consideration.¹⁹¹ Amended Proposed Directive Article 3a states that “data processing is not considered to be a field of technology in the sense of patent law, and that innovations in the field of data processing are not considered to be inventions in the sense of patent law.”¹⁹² Amended Proposed Directive Article 4a made the European Parliament’s repudiation of the E.C.’s Proposed Directive clear in stating, “[a] computer-implemented invention shall not be regarded as making a technical contribution merely because it involves the use of a computer, network or other programmable ***28** apparatus.”¹⁹³ Article 4a.1 continues by explicitly excluding claims for “business, mathematical or other methods” that do not produce any non-computer based physical effects.¹⁹⁴

Proponents of software patents considered the Amended Proposed Directive unacceptable. Not only would the

computer-implemented accounting system of our example not be patentable under its provisions, but the technique for enhancing digital images that the EPO Boards of Appeal allowed in VICOM would also fail to be patentable.¹⁹⁵ Proponents of the two proposed directives would need the European Council of Ministers' (Council) approval for enactment.¹⁹⁶ While the E.C. has the sole power to initiate legislation, both the Council and the European Parliament must approve legislation in identical form for enactment.¹⁹⁷ In releasing their "Common Position,"¹⁹⁸ the Council supported the position of the E.C. by rejecting virtually all the European Parliament's amendments to the Proposed Directive and reinstating the Proposed Directive in its entirety.¹⁹⁹ At this point, inaction by the European Parliament would have resulted in the adoption of the E.C.-Council Common Position. However, in July 2005, the European Parliament voted 648 to 14 to reject the Common Position, thereby killing the Proposed Directive.²⁰⁰

Some have proclaimed that the legislative failure was a setback for the goal of E.U. harmonization of intellectual property law.²⁰¹ While harmonization clearly was a worthy aim, the Proposed Directive represented more than an act of harmonization. Critics of the Common Position argue that the actual intent of the proposal was to move the E.U. towards "unlimited patentability and patent *29 enforceability" of business methods and software.²⁰² To support its assertion, one group, the Foundation for a Free Information Infrastructure, asserted that the Amazon.com one-click claim discussed above²⁰³ would have been patentable under the Common Position.²⁰⁴ While critics are sometimes prone to hyperbole, it is likely that the Amazon.com one-click computer-implemented purchasing process, when judged as a whole as required under Proposed Directive Article 4.3 and the Common Position, would constitute a patentable inventive step.²⁰⁵ The Amended Proposed Directive would have unambiguously disallowed such a result. By contrast, it is unequivocal that under the Amended Proposed Directive the one-click process considered independently or its computer-based implementation would not satisfy the inventive step requirement for patentability.²⁰⁶

4. The Microsoft Factor

Currently, the prospects for increased recognition of business method patents in Europe are slight. While Europe has recognized some software computer-implemented business method patents and software,²⁰⁷ the areas of patentability are far more limited than in the U.S.²⁰⁸ While the distinctions are subtle, they are real and significant. Pure business method patents (those that are non-technical/non-computer implemented) are unlikely to be recognized as they are in the U.S. due to a history of restricting patent recognition to technical inventions.²⁰⁹ In addition, well-organized opposition groups, such as open-source groups and small businesses believe that the movement for increased recognition of computer-implemented business method patents benefits large transnational corporations at the expense of smaller companies and consumers, as well as stifles innovation.²¹⁰ These groups have been extremely successful in mobilizing grassroots actions to influence *30 elected representatives in the European Parliament.²¹¹ The open-source community has been particularly effective in using Microsoft as a lightning rod to rally against expanding the recognition of software and business method patents.²¹² The fear of Microsoft and similar large software companies has proved to be sufficient incentive to maintain the vigilance of opposition groups.

Ironically, despite the expressed rationale of harmonization behind the Proposed Directive, European software patent treatment is relatively consistent across countries. As stated in the Proposed Directive, the EPO, Germany, and the U.K. are the only European bodies with significant software-patent case law.²¹³ Germany has maintained that its approach to computer-implemented inventions is consistent with the EPO approach.²¹⁴ The U.K. courts, not as open to software patents as their German counterparts, have adopted an approach that is likely to produce results that are similar to the EPO's in most cases.²¹⁵

Nonetheless, the overall level of consistency is not reflected in the decisions of the European courts. Uncertainty remains a problem due to the tortured efforts of the courts to draw a line between prohibited software claims and inventions implemented through software. While it is clear that pure business methods implemented through software cannot be patented, it is unclear when computer-implemented business methods become patentable. This ambiguity may, over time, create pressure for another harmonization effort. However, such an effort is not foreseeable in the near future and is unlikely to adopt the U.S. approach.

B. Japan

Japanese patent law, based in large part on German patent law, bears a strong resemblance to European Union law.²¹⁶ However, the evolution of Japanese patent law also drew from the U.S. patent experience. Purportedly, a Japanese delegation

visited the U.S. patent office in 1899. The delegates, thoroughly impressed and believing that the greatness of the U.S. was in some part attributable to its patent system, vowed to create a patent system in Japan.²¹⁷ Therefore, it is not surprising *31 that the Japanese treatment of business method and software patents is somewhere between the two other patent law traditions. Japan, a civil law country, has no case law to provide guidance. Therefore, relevant patent law is embodied in statutory law and administrative guidelines. Under Japanese law, as with European law, patentability requires that an invention be “industrially applicable.”²¹⁸ Japanese patent law refines this definition by requiring an industrially applicable invention to also be a “highly advanced creation of technical ideas by which a law of nature is utilized.”²¹⁹

In response to the U.S. recognition of business method patents, the Japanese Patent Office (JPO) drafted “Guidelines for Computer-Software Related Inventions” (Software Guidelines), which explicitly prohibit granting patents for business methods.²²⁰ The Software Guidelines reference “statutory” requirements from another section of the JPO examination guidelines, which states that “[i]f claimed inventions are any laws as such other than a law of nature (e.g., economic laws), arbitrary arrangements . . . , mathematical methods or mental activities, or utilize only these laws (e.g., methods for doing business as such), these inventions are not considered to be statutory”²²¹ However, a software or computer-implemented business method invention is patentable if it involves “a creation of technical ideas utilizing a law of nature.”²²² The JPO at one level has not categorically rejected the patentability of business methods, as EPC Article 52 *32 appears to do.²²³ Instead, at the review level, it has adopted the criteria of technical advancement or contribution akin to that found in E.U. patent law.²²⁴

The Software Guidelines list a number of requirements for patentability. The requirements include: (1) enabling detailed description, (2) ministerial ordinance, (3) statutory invention, and (4) inventive step.²²⁵ The first two requirements stated above are more procedural in nature in that they are directed at the content and format of the description of the invention in the patent application.²²⁶ The Enabling Detailed Description Requirement requires that the claimed invention be described so that it can be identified by a person skilled in the relevant art and for the description to be stated “in [such] a manner sufficiently clear and complete for the invention to be carried out by a person having ordinary skill in the art to which the invention pertains.”²²⁷

The Ministerial Ordinance Requirement requires that the description of an invention include a statement of the problem being solved by the invention and its solution.²²⁸ It also provides an exception to this requirement for “invention[s] developed based on an entirely new conception.”²²⁹ However, the Software Guidelines expressly single out software as not being based on an entirely new conception: “One could hardly imagine that such kind of inventions are created in the field of software related technology.”²³⁰ The Software Guidelines conclude that it is therefore imperative that such inventions state the “technical field to which the invention pertains” and “the technical significance of the invention.”²³¹

The Ministerial Ordinance Requirement is simply the descriptive form for providing the information needed to satisfy the substantive elements of patentability--statutory invention and either inventive step or non-obviousness. The statutory invention or subject matter requirement mandates that a patentable invention is one that is a “creation of technical ideas utilizing a law of nature.”²³² In the area of software, business methods, or computer-related inventions, this requires more than the “information processing by software which is concretely realized by using hardware resources”²³³ and more than the mere statement of *33 programming language or a program listing.²³⁴ The Software Guidelines assert that solutions relating to a number of computer related problems--including control of hardware, information processing based on the physical or technical properties of an object, and information processing using hardware--are deemed to utilize natural laws thereby bringing them within the scope of statutory inventions.²³⁵ The Software Guidelines provide these examples: (1) a computer program for controlling the rate of fuel injection for an automobile engine (control of hardware), (2) computer program for image processing (information processing based on physical or technical properties of object), and (3) an apparatus for predicting daily sales of commodities (information processing using hardware).²³⁶

The final requirement of patentability is the Inventive Step Requirement. The Software Guidelines partially define an inventive step in the negative, noting that the inventive step may be properly denied if “a person skilled in the art could have easily arrived at a claimed invention based on cited inventions.”²³⁷ The Software Guidelines expressly note that “combining technologies used in different fields and applying them to another field is usually to be within the exercise of an ordinary creative activity of a person skilled in the art.”²³⁸ The Software Guidelines then provide discussion of areas where this is often the case.²³⁹ This discussion is most relevant to business methods and software even though the term “business methods” is not expressly mentioned.

Those areas where the inventive step requirement is difficult to prove include application to other fields, addition of a

commonly known means or replacement by an equivalent, implementation by software of functions which are otherwise performed by hardware, systemization of human transactions, reproduction of a known event in computerized virtual space, and design modification on the basis of facts or customs.²⁴⁰ Thus, if a known business method in one field is applied in another field such application would not be considered an inventive step.²⁴¹ Software-related inventions that integrate hardware and software by supplementing *34 or replacing that integration with a “commonly known means for systemization” would also not constitute an inventive step.²⁴²

The exclusion from patentability that has the most bearing on business methods that do not possess a high level of technological advancement is the one pertaining to the “systemization of human transactions.”²⁴³ The Software Guidelines exclude from patentability due to a lack of a sufficiently inventive step:

[Inventions that are] within the ordinary creative activity expected of a person skilled in the art to systematize existing human transactions in an applied field in order to realize on a computer, if the said systematization can be realized by a routine activity of usual system analysis method and system design methods.²⁴⁴ It is likely that the invention patented in State Street Bank would have found difficulty in avoiding this exclusion under Japanese patent law. For example, two Japanese courts have held that a support system for managing condominium buildings, a message management apparatus, and an apparatus for an auction center were not patentable because they were “something at which a person skilled in the art could have easily arrived.”²⁴⁵ In the area of ordering and marketing, Japanese courts have rejected the patentability of a product selling system,²⁴⁶ customer management system,²⁴⁷ and a site control distribution system.²⁴⁸

Closely related to the exclusion for the systemization of human transactions is the test recognized under the Software Guidelines that looks to the “effects of the invention” to determine if there is a legally recognizable technical (inventive) step.²⁴⁹ Thus, an “invention” that allows for quicker processing of data, minimizes errors, or allows for obtaining uniform results would not be patentable because such results are often obtained “as a result of computerization [which] cannot usually be said to be unforeseeable from the knowledge of the state of the art.”²⁵⁰ Note the different use of the effects of the invention approach compared to U.S. law. Under U.S. law something that produces a tangible, useful result would be patentable; however, under Japanese law, such a result may be insufficient to satisfy the inventive step requirement.

*35 The requirement of technical advancement is defined as “methods characterized by a high level of a creative technological idea [including] . . . hardware and related computer programs.”²⁵¹ As to “methods,” the JPO states that:

[T]he purpose of the law is to protect a high level of creativity in technological concepts which use natural laws and rules. Consequently, calculation methods or encryption determined [sic] by arbitrarily defined rules, for instance for finance and insurance systems or taxation methods, which are not based on natural laws and rules, do not represent a protected subject [T]he created product must be characterized by a high level of technological creativity because a creation characterized by a low technological creativity level cannot be protected.²⁵²

Elsewhere, the JPO states that an inventive step is to be denied where there is an application of technology from one field to another, the invention involves the automation of manual tasks, or the invention involves merely the change of a design based on artificial arrangements.²⁵³ Despite these exclusions, one thing is clear: like U.S. patent law, computer programs are treated like any other type of product invention.²⁵⁴ The EPO’s inventive step “plus” is not required in Japan. Therefore, while Japan’s business method patent law is in most cases more restrictive than the corresponding U.S. patent law but is not as restrictive as European patent law.²⁵⁵

C. Summary

Since the State Street Bank decision, Europe and Japan have increased their recognition of the patentability of software and business method patents. However, while both regimes and the U.S. have considered full recognition of business method patents, only the U.S. has accepted the patentability of non-technical and non-computer-implemented business methods. Europe and Japan have emphatically rejected the recognition of abstract, intangible business methods. Both regimes continue to struggle with computer-implemented claims. While Europe and Japan recognize that there is little practical difference between *36 recognizing abstract business methods and the business methods implemented via computer, drawing the line between computer-implemented business methods and patentable technically innovative computer-implemented claims has been extremely difficult.

Europe and Japan have attempted to draw the above distinction through the implementation of the “inventive step” patentability requirement. In Europe, the EPO deals with the problem by identifying the area of technical contribution. In the U.K., the invention must be considered creative if implemented by a “little old man in a control room” rather than by a computer. Japan addresses the problem by imposing a “high level of a creative technological idea” requirement for patentability.²⁵⁶ Unquestionably, any of these tests would significantly reduce the number of approved business method claims disguised as computer-implemented inventions. However, there is still much subjectivity involved in implementing these tests. This subjectivity insures the continued existence of ambiguity, uncertainty, and suspicion about the patentability of business methods in Europe and Japan.

By contrast, the U.S. patent system, having stepped off the precipice, is still in freefall. Without even a minimal computer-implementation requirement, the USPTO has a difficult time stemming the flood of questionable and potentially malignant business method patent claims. The lack of consistency between the three major patenting regimes continues to produce the potential for commercial conflicts and inter-regime competitive advantages. Part IV suggests a policy-driven approach to clarify the confusion endemic in the Trilateral Patent System and for harmonizing international patent law.

IV. Towards a Coherent International Treatment of Business Methods and Software Patents

The U.S. rejection of a technical aspects requirement guarantees that U.S. recognition of the patentability of business methods will not align with European and Japanese laws in the foreseeable future. There is an outside possibility that these conflicts can be resolved without concerted effort. The Supreme Court may act to restrict the recognition of business method patents.²⁵⁷ While such a decision will increase harmonization, it is highly unlikely to align U.S. law with the more nuanced approaches practiced in Europe and Japan.²⁵⁸ Alternatively, the E.U. and Japan may maintain a façade of excluding business method patents from their definitions of statutory subject matter while surreptitiously loosening the constraints imposed by those definitions. However, the vigilance of open-source activists in Europe renders this contingency purely speculative.²⁵⁹ Moreover, while *37 Japan seems open to extending patent coverage to protect software, there is little evidence to suggest that there is any support for granting patent coverage for non-computer-implemented business methods. The continuing WIPO patent harmonization effort also is unlikely to resolve this issue. This harmonization has bogged down into a battle between developed and developing countries over the proper treatment of genetic resources and traditional knowledge that the likely treaty to emerge from this process will be limited to relatively minor procedural issues.²⁶⁰

Given the judicial response discussed earlier, the onus is on the U.S. Congress to intervene to adjust the common-law treatment of business method patents. The present common-law approach is unable to address the economic failures and impracticalities associated with the overly broad protection endemic to business method patents. Congress should revise U.S. patent law to align it more closely with the laws of Europe and Japan. The final sections explore what a policy-driven patent law would look like in the U.S.

A. The Case for Changing U.S. Business Method and Software Patent Law

The literature has presented the case against the recognition of business method patents.²⁶¹ We make the case here that the hope of international harmonization of business method and software patent law rests with a change in the U.S. patent law system. The problem with completely revoking recognition of such patents is that the expansion of patent protection for business methods and software has become accepted practice in the U.S. As one commentator noted:

[P]atent policy has now progressed to the point where computer-related inventions no longer are considered a unique class of technology requiring special scrutiny. The fact that [such inventions] rely heavily on mathematical algorithms or implement methods of doing business is not important in appraising their suitability for patent protection.²⁶²

This position, unique to the U.S. patent system, stands squarely in the path of the goal of international patent harmonization.²⁶³ Our analysis shows that it is *38 highly unlikely that Europe and Japan will adopt the U.S. treatment of business method and software patents.²⁶⁴ By contrast, the continuing problems that the USPTO has in managing business method patents, the negative impact of patent trolls (patent holders who profit from their intellectual property solely by filing infringement lawsuits against large technology companies),²⁶⁵ and the growing Supreme Court discomfort with business

method patents provides a clear impetus for U.S. legislative action.²⁶⁶ The following subsections discuss the policy arguments against the liberal granting of business method and software patents. Based upon this analysis, the article concludes with a discussion of recommended reform options available to Congress.

1. A Skewed Patent Cost-Benefit Equation: Marginal Patent-Associated Benefits and Significant Social Welfare Losses

Moving the U.S. patent treatment of business method and software towards the European and Japanese approaches would not only increase harmonization but would also enhance social welfare. Recognition of business method and software patents is welfare diminishing.²⁶⁷ The purpose of patent law is to provide inventors with incentives to innovate by providing limited periods of exclusive control over their inventions.²⁶⁸ The exclusive rights associated with a patent provide its holder with a monopoly over the invention.²⁶⁹ The deadweight losses that accompany underproduction and non-marginal-cost pricing in monopoly situations are also present in markets in which a patented product is dominant with few or no close substitutes.²⁷⁰ The gains in innovation and knowledge creation must be substantial *39 to exceed the losses associated with patent exclusivity. In fact, there is evidence that business method and software patents do not increase innovation.²⁷¹ Prior to broad recognition of software patents, innovation was extremely high.²⁷² Much of the software innovations during the 1970s and 1980s occurred with little reliance on patent law.²⁷³ The culture of computer programmers prior to software patents was one of shared and rapid innovation and continues today in the Open Source movement.²⁷⁴ Rather than enhance innovation, it may be the case that software patents actually impede innovation.²⁷⁵ In the next section, we explore in detail the implications of patent protection for cumulative and sequential technologies.

2. Cumulative Technologies and The Problem of Patent Scope: Innovation-Reducing Consequences

The potential harm from continued recognition of business method and software patents exceeds the basic social welfare calculus presented above. These additional losses are due to the tendency for business method and software patent grants to be overly broad in scope. One scholar notes:

Because business method patents are non-technical in nature, they tend to be over-inclusive. Specifically, e-commerce “inventions” protected by business method patents “merely apply long-standing business techniques to the Internet.” Thus, these business method patents are granted to protect “broad concepts” rather than actual invention.²⁷⁶ *40 Exacerbating this problem is the limited prior art available to judge whether business method and software patents are truly novel inventions.²⁷⁷ Although Professor Kitch suggests in his prospect theory that broad patent grants may be welfare enhancing,²⁷⁸ this conclusion is based on specific assumptions that likely do not apply to software patents because software innovations are cumulative and sequential in nature.²⁷⁹ Professors Merges and Nelson, in their analysis of patent scope, provide qualitative evidence rebutting Kitch’s conclusion for cumulative innovative technologies.²⁸⁰ In such industries, they argue, holders of broad patents covering key technologies tend to slow innovation rates and block others from gaining access to the subject areas of such patents.²⁸¹

Software and business method innovations are subject to the dynamics that Merges and Nelson describe for technologies in which innovation occurs in small incremental steps often advancing the prior art with small but significant refinements. A clever programming technique may resolve a problem that may have vexed programmers for months or longer, or a programmer may offer a significantly faster or more efficient approach to addressing a previously solved problem. In these situations, a jury may be unable to recognize the subtlety and significance of the advance. Therefore, a significant and important improvement may be blocked, or even worse, subject to an equivalents claim.²⁸² In sum, the incremental and sequential nature of software innovation, combined with the *41 absence of clear guidance in determining the relevant art, gives patent holders power to block others from innovating in related fields.²⁸³

3. The Problem of Non-Disclosure

Patent law requires inventors to publish information that is sufficient to enable one of ordinary skill in the art to make and use the invention.²⁸⁴ However, evidence suggests that U.S. software and business method patent grants tend to be overly broad. This bias is connected to the CAFC’s allowance of such patent claims with limited disclosure.²⁸⁵ For example, the typical published software patent rarely discloses much detail beyond the function or purpose of the invention.²⁸⁶ Inventors prefer to limit disclosure for several reasons. First, the inventor may want to conceal a truly clever innovation from competitors. This strategy, in essence, provides the inventor with a trade secret as well as patent protection. Limited disclosure allows software patent holders to continue benefiting from their invention and related research for longer periods. In such situations, competitors cannot use knowledge learned from the published patent to infringe the software patent or to develop work

around and extensions to the invention. Second, in a patent race, an inventor may wish to stake a claim at the earliest possible date in order to lock out potential challengers. Third, limited disclosure also allows the inventor to exaggerate the breadth of his invention. Fourth, limited disclosure allows inventors to hide defects in enablement specifications. In the last three circumstances, the lack of disclosure gives the inventor additional time to correct defects in his invention and continue research in order to expand his patent's coverage, while at the same time deterring other potential innovators.

Limited enablement-level disclosure has several additional implications. The first implication is that patent publication does not advance the prior art. The published patent provides little notice as to the boundaries of the patent and fails to provide enough information to facilitate additional research in the field. Without full disclosure, some "innovations" that are obvious extensions cannot be challenged because the prior art is not available. Limited disclosure also creates ambiguity as to the expanse of prior art. This ambiguity enhances the potential for innovators to inadvertently infringe or for patent trolls to claim infringement.²⁸⁷ The following subsection discusses an additional implication, namely, the relationship between limited disclosure and overly broad patent grants.

*42 4. The Relationship Between Patent Breadth and Lack of Disclosure

As discussed in the previous section, there is a tendency for business method and software patents to be overly broad due to the lack of enablement-level disclosure and relatively undeveloped prior-art records. In some cases, the bias towards allowing broad software patents may come close to the level of patenting ideas or, at minimum, protecting unpatentable components of an invention.²⁸⁸ For example, unlike many areas of innovation, there are almost unlimited ways to code a particular software process or function. Some differences are minor consisting of different choices in programming languages or practices. Other differences may be more substantial but do not constitute a significant enough improvement to be considered a new or different invention. However, other differences may represent radically different approaches to addressing and coding the problem. The related innovation may add performance gains and enhanced functionality that are clearly superior to the patent-protected software. However, without a comprehensive prior art record and detailed patent disclosure, patent examiners and courts are unlikely to accurately distinguish infringing minor improvements from software innovations that are different and truly significant advances entitled to protection under the reverse doctrine of equivalents.²⁸⁹ Similarities between patents and such innovations are likely to lead courts and juries to decide in favor of incumbent patents, thereby precluding the marketing of truly innovative advances.²⁹⁰ Thus, extending software patent coverage in such instances significantly increases welfare losses without any concomitant social gain.

B. Reform Recommendations

In light of the preceding section's analysis, we recommend the adoption of both substantive and procedural reforms to address identified deficiencies in U.S. business method and software patent law. In the area of substantive reforms, we argue that in order to address the problem of patent scope discussed earlier, Congress should adopt an inventive step requirement akin to requirements employed under European and Japanese patent law. For business method and software that fail to satisfy the inventive step requirement, but satisfy all the other patent requirements, Congress should create sui generis protections, which would be of a lower order to those provided under patent law. In the area of process *43 reform, we recommend that the USPTO take measures to more fully enforce the enablement and best mode requirements. It is also important that an enhanced opposition procedure be adopted.

1. Substantive Law Reforms

The probability of Congress or the courts eliminating the now-entrenched recognition of business method and software patents is low.²⁹¹ Although such patents may not provide significant innovation incentives, they do contribute to corporate wealth.²⁹² The powerful interest groups that benefit from business method and software patents are likely to form a formidable blocking coalition against such a move. Many of the biggest opponents of patent trolls such as Microsoft and other big technology companies also benefit greatly from software patents.²⁹³ In addition, the opponents of patent reform have a strong ally in big pharma, which is strongly opposed to legislation that would threaten its ability to protect highly profitable drug patents.²⁹⁴ More importantly, interest groups that favor eliminating these patents are not well organized, and therefore, are unlikely to exert sufficient influence over Congress.²⁹⁵ Thus, this section considers less draconian reforms that Congress is more likely to implement given political realities.

The best alternative short of eliminating business method and software patents is for the U.S. to adopt an inventive step

requirement akin to the European and Japanese approaches.²⁹⁶ In evaluating a patent claim, the examiner would identify the field or useful art to which the innovation contributes. If the useful art were economics, accounting, math or another business-related field, the claim would not satisfy the inventive step requirement.²⁹⁷ This approach provides multiple benefits. It eliminates all non-computer-implemented business method *44 patents and raises the bar for software patents. Therefore, the quality of patents issued after implementing this proposal would increase. Second, it would largely harmonize the Trilateral Patent System. The EPO already employs this approach and the Japanese approach is not substantially different.²⁹⁸

Alternatively, along with adopting the inventive step requirement for patentability, non-computer-related business method inventions could be protected through the creation of a sui generis category of protection. Such a sui generis or new category of intellectual property protections would likely provide a much reduced duration or term of protection. For example, Jeff Bezos has suggested a protection period of three to five years.²⁹⁹ This protection would be similar to the E.U. protection granted to developers of databases. Such protection, like those for databases, would only be available to those who have incurred a substantial investment in developing the invention or innovation.³⁰⁰ Business method and software that fail the inventive step requirement but otherwise satisfy the requirements for patentability would qualify for sui generis protection. This sui generis approach would create an independent category of intellectual property protections. These protections would be of a lower order to protections granted under present patent law.

The primary rationale for sui generis treatment of business method and software patents is that the social costs are so great relative to their social benefits that these costs need to be contained by limiting the exclusivity term. We do not contest the benefit of valuable business method and software patents to their holders; rather we question whether such benefits exceed the social costs such patents impose. We recommend an exclusivity period of three-to-five years. Due to the rapid advance of technology and the generally lower investment levels required to create such inventions relative to the amounts required to produce more technology-intensive investments such as semiconductors and pharmaceutical products,³⁰¹ this shorter period would provide inventors enough time to recoup their investments while limiting the innovation-retarding effects on others.³⁰² The *45 shorter term will also limit the time that patent trolls have to prey on innovative firms with marginal and incremental patent infringement claims.³⁰³ At the same time, it provides sufficient time for innovators to recoup their investments in developing business methods and software.

2. Procedural Reforms

We recommend that Congress adopt a number of procedural reforms to improve the quality of granted patents. First, vigilant enforcement of the enablement and best mode³⁰⁴ disclosure requirements will dramatically improve prior art records. This reform will help reduce the uncertainty of patent scope and the ability of patent holders to overreach. Such improved disclosure requirements will produce more consistent patent prosecution and reduce the issuance of marginal patents. Second, there remains a need for an effective opposition procedure. Such a process is an integral component of both European and Japanese patent law.³⁰⁵ It provides an additional means to verify the quality of a patent claim. Allowing third parties to introduce evidence of existing prior art and to question the obviousness of a patent claim will enhance patent quality without significantly increasing the cost of obtaining such patents. Challengers will oppose only controversial and important patents, so any additional expense will be targeted and there will be lower litigation expenses compared to a system in which all patents receive added scrutiny.³⁰⁶

V. Conclusion

U.S. court recognition of business method and software patents created a substantial divide in international patent law. Without regard to pragmatic considerations, U.S. courts so far have seen no reason under law to constrain the recognition of either business methods or software patents. By contrast, Europe and Japan have both attempted to limit the negative social welfare implications of expanding patent recognition by legislatively prohibiting non-computer-implemented business method patents and imposing limitations on the patentability of software.³⁰⁷

The broad recognition of the patentability of all types of business methods by U.S. courts, including the recognition of non-technical or non-computer-implemented business methods, is the source of significant social welfare losses in *46 the U.S. Europe and Japan's attempts to draw a line between high and low quality business method and software innovations better balance the need to stimulate innovation while preventing unnecessary anti-competitive or overly broad patent recognition. Furthermore, the lack of consistency and harmony among members of the Trilateral Patent System due to the U.S. recognition of business methods increases the costs of engaging in international business.

After reviewing the current state of business method and software patent law internationally, we conclude that the requirement of an inventive step found in Europe is superior to the U.S. approach.³⁰⁸ Although commentators have criticized the European approach for being opaque,³⁰⁹ the approach does a superior job of distinguishing between innovative and non-innovative computer-implemented inventions.³¹⁰ The U.S. approach does not promote efficiency and is extremely costly from a social-welfare perspective. For these reasons, Europe and Japan are unlikely to follow the U.S. lead in the treatment of business method and software patents. While the European and Japanese approaches are not optimal,³¹¹ they come much closer to achieving optimality than does the U.S. approach. Therefore, it follows that the best possibility for international harmonization of business method and software patent law rests on reforming the U.S. patent system in order to bring it into alignment with European patent law.

The U.S. adoption of an inventive step requirement for computer-implemented business method and software innovations and the creation of *sui generis* protection for non-computer-implemented business methods would promote international harmonization while significantly increasing the efficiency of U.S. business method and software patent law. Less dramatic changes would also add to the efficiency of U.S. patent law in this area. Strict enforcement of enablement and best mode disclosure requirements would reduce ambiguity and limit opportunistic behavior. Finally, creating a post-grant third-party opposition process would add an important error-correcting mechanism that has proven effective in Europe and Japan. The reforms recommended here would significantly enhance the efficiency of U.S. business method and software patent law while achieving a higher level of international patent law harmonization.

Footnotes

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¹ *State St. Bank & Trust Co. v. Signature Fin. Group, Inc. (State Street Bank)*, 149 F.3d 1368 (Fed. Cir. 1998) (holding that business software designed to perform financial calculations for an investment fund is patentable). A year later, the CAFC reinforced its support for the patentability of business methods. *AT&T Corp. v. Excel Commc'ns, Inc.*, 172 F.3d 1352, 1357 (Fed. Cir. 1999) (stating that "the scope of [patentable subject matter is] the same regardless of form--machine or process--in which a particular claim is drafted.").

² The failure of the courts and Congress to adequately define business methods means that the question is not merely one of whether business methods should be subject to patent protection but also a question of defining the scope of business method protection. See, e.g., Matthew D. Thayne, *Business Method Patents, Franchises, and the First Inventor Defense Act: Something Must Give*, 2001 Utah L. Rev. 863, 880 (noting that "the term 'method' [as applied to business methods] is ambiguous."); James R. Barney, *The Prior User Defense: A Reprieve for Trade Secret Owners or a Disaster for the Patent Law?*, 82 J. Pat. & Trademark Off. Soc'y 261, 261 (2000) (noting that in Congress's statutory response to *State Street Bank*, "methods of conducting business" was not defined).

³ See *Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992) (allowing patent protection for a computer-based system of measuring, converting, and evaluating electrocardiograph signals to identify patients with a high ventricular tachycardia risk); see also Giovanni F. Casuccci, *Software and Computer-Related Inventions: Protection by Patent and Copyright*, in *New Frontiers of Intellectual Property Law* 161 (Christopher Heath & Anselm Kamperman eds., 2005) (surveying the protections offered software and computer-related inventions through copyright and patent law).

⁴ See *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (holding that software-directed computer operations were statutory subject matter). See generally David S. Evans & Anne Layne-Farrar, *Software Patents and Open Source: The Battle Over Intellectual Property Rights*, 9 Va. J.L. & Tech. 10 (2004) (recounting the evolution of software patents).

⁵ *State Street Bank*, 149 F.3d at 1373.

6 Id. at 1372.

7 See *infra* Part III.

8 See *State Street Bank*, 149 F.3d at 1375 (emphasizing this point in stating, “[s]ince the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method.”).

9 35 U.S.C. §§101-103 (2000). See also *Diamond v. Diehr*, 450 U.S. 175, 182 (1981) (noting that “Congress intended statutory subject matter to ‘include anything under the sun that is made by man.’”) (quoting S. Rep. No. 82-1979, at 5 (1952); H.R. Rep. No. 82-1923, at 6 (1952)).

10 See, e.g., Carl Shapiro, *Patent System Reform: Economic Analysis and Critique*, 19 *Berkeley Tech. L.J.* 1017, 1018 (2004) (stating that “[i]n particular, critics have berated the quality of patents in the areas of computer software and Internet business methods”); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 *Nw. U. L. Rev.* 1495, 1495 (2001) (noting that “[t]he criticism [allowing bad patents] is particularly strong in specific industries, notably software and Internet ‘business method’ patents.”); Rochelle Cooper Dreyfuss, *Are Business Method Patents Bad for Business?*, 16 *Santa Clara Computer & High Tech. L.J.* 263, 274-77 (2000) (questioning the value of business method patents and critiquing the general trend in IP law toward excessive protection without any underlying rationale). But see John R. Allison & Starling D. Hunter, *On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 *Berkeley Tech. L.J.* 729 (2006); John R. Allison & Emerson H. Tiller, *The Business Method Patent Myth*, 18 *Berkeley Tech. L.J.* 987 (2003) (providing empirical evidence that the quality of business method patent claims are not significantly inferior to other patent claims). Other scholars have examined and criticized business method patents on a variety of bases. See Andrea Lynn Evensen, “Don’t Let the Sun Go Down on Me:” An In-Depth Look at Opportunistic Business Method Patent Licensing and a Proposed Solution to Allow Small-Defendant Business Method Users to Sing a Happier Tune, 37 *J. Marshall L. Rev.* 1359 (2004); Keith E. Maskus & Eina Vivian Wong, *Searching for Economic Balance in Business Method Patents*, 8 *Wash. U. J.L. & Pol’y* 289 (2002); Michael J. Meurer, *Business Method Patents and Patent Floods*, 8 *Wash. U. J.L. & Pol’y* 309, 313 (2002); Larry A. DiMatteo, *The New “Problem” of Business Method Patents: The Convergence of National Patent Laws and International Internet Transactions*, 28 *Rutgers Computer & Tech. L.J.* 1 (2002); Malla Pollack, *The Multiple Unconstitutionality of Business Method Patents: Common Sense, Congressional Consideration, and Constitutional History*, 28 *Rutgers Computer & Tech. L.J.* 61, 66-69 (2002); John R. Thomas, *The Post-Industrial Patent System*, 10 *Fordham Intell. Prop. Media & Ent. L.J.* 3 (2000).

11 The USPTO imposed a “technological arts” requirement in *Ex parte Bowman*, 61 U.S.P.Q.2d 1669, 1671 (B.P.A.I. 2001). It also instituted a “second-pair of eyes” follow-up review of all allowed Class 705 (the category containing business method patents) patent applications. USPTO, *Business Method Patent Initiative: An Action Plan*, <http://www.uspto.gov/web/offices/com/sol/actionplan.html> (last visited June 9, 2007).

12 See *Ex parte Lundgren*, 76 U.S.P.Q.2d 1385, 1387 (B.P.A.I. 2005) (retreating from the *Bowman* effort to restrict business method patents due to a lack of legal authority).

13 *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

14 See *infra* Part III.A.

15 See Justine Pila, *Dispute Over the Meaning of “Invention” in Article 52(2) EPC: The Patentability of Computer-Implemented Inventions in Europe*, 36 *Int’l Rev. of Indus. Prop. & Copyright L.* (2005) (providing a critical examination of the logic behind European Patent Office interpretation of EPC patent exclusions), available at <http://ssrn.com/abstract=593881>.

16 See, e.g., Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 *Cal. L. Rev.* 1, 3 (2001) (noting that “[w]ith roughly eighty thousand software patents already issued, and the CAFC endorsing patentability without qualification, those questions [of whether software should receive patent protection] are for the history books”).

- 17 Id. at 56; see also Andrew Kopelman, Addressing Questionable Business Method Patents Prior to Issuance: A Two-Part Proposal, 27 Cardozo L. Rev. 2391 (2006) (arguing that business method applicants should have an affirmative duty to search and disclose prior art).
- 18 See Francisc Marius Keeley-Domokos, State Street Bank & Trust Co. v. Signature Financial Group, Inc., 14 Berkeley Tech. L.J. 153 (1999) (analyzing State Street Bank); see also Ann Marie Rizzo, The Aftermath of State Street Bank & Trust v. Signature Financial Group: Effects of United States Electronic Commerce Business Method Patentability on International Legal and Economic Systems, 50 DePaul L. Rev. 313 (2001) (providing a brief history of the development of business method patent law).
- 19 See John Bagby, E-Commerce Law 245 (South-Western Education Publishing 2003) (examining the development of business method patents and noting that business method patent claims often tried to “characterize business methods as something else--software or other types of processes--to avoid business method patent difficulties.”).
- 20 Ex parte Bowman, 61 U.S.P.Q.2d 1669 (B.P.A.I. 2001).
- 21 Ex parte Lundgren, 76 U.S.P.Q.2d 1385 (B.P.A.I. 2005).
- 22 Laura R. Ford, Alchemy and Patentability: Technology, “Useful Arts,” and the Chimerical Mind-Machine, 42 Cal. W. L. Rev. 49, 58 (2006).
- 23 Id.
- 24 Id. at 59; see, e.g., Corning v. Burden, 56 U.S. 252, 268 (1854) (“It is for the discovery or invention of some practicable method or means of producing a beneficial result or effect, that a patent is granted, and not for the result or effect itself.”).
- 25 See Ford, supra note 22, at 60.
- 26 Report of the President’s Comm’n on the Patent Sys., “To Promote the Progress of ... Useful Arts” In an Age of Exploding Technology 12-13 (1966) (on file with Journal).
- 27 Id. at 13.
- 28 Id. (“It is noted that the creation of programs has undergone substantial and satisfactory growth in the absence of patent protection and that copyright protection for programs is presently available.”).
- 29 See generally Evans & Layne-Farrar, supra note 4, at 10 (reviewing the evolution of the software patent in the U.S.).
- 30 In re Prater, 415 F.2d 1378 (C.C.P.A. 1968), modified on reh’g, 415 F.2d 1393 (C.C.P.A. 1969).
- 31 Gottschalk v. Benson, 409 U.S. 63 (1972).
- 32 Diamond v. Diehr, 450 U.S. 175, 192-93 (1981).
- 33 In re Alappat, 33 F.3d 1526, 1544 (Fed. Cir. 1994).

34 Cohen & Lemley, *supra* note 16, at 10.

35 State Street Bank, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

36 See *id.* (stating that “the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces ‘a useful, concrete and tangible result.’”).

37 AT&T Corp. v. Excel Commc’ns, Inc., 172 F.3d 1352 (Fed. Cir. 1999). The CAFC subsequently reinforced the mandate that business methods are to be treated just like any other process patent. See *MercExchange, LLC v. eBay, Inc.*, 401 F.3d 1323 (Fed. Cir. 2005), cert. granted, 546 U.S. 1029 (2005), vacated and remanded, 126 S. Ct. 1837 (2006) (reversing a lower court decision that a permanent injunction was not an appropriate remedy in an infringement case involving business method patents).

38 AT&T Corp., 172 F.3d at 1357.

39 *Id.* at 1358.

40 United States Patent and Trademark Office (USPTO), Patent Business Methods - Class 705 Application Filing and Patents Issued Data, <http://www.uspto.gov/web/menu/pbmethod/applicationfiling.htm> [hereinafter USPTO Class 705 Data] (last visited June 9, 2007). From 1998 to 2001 the number of patent applications filed under Class 705 (the class covering business method patents) increased by nearly 650% from 1,340 to 8,700. See Jonathan Lindsay, Business Method Patents Online (Mar. 10, 2000), <http://cyber.law.harvard.edu/property00/patents/main.html> (estimating that the number of Internet-related patents granted by the patent office rose from 165 in 1995 to 2,193 in 1998); Joff Wild, Europe Lags US in Business-Method Patents, *Euromoney*, Mar. 1, 2002, at 28, available at http://faculty.fuqua.duke.edu/~charvey/Teaching/BA453_2006/EuromoneyBusinessMethodIP.pdf (reporting that the number of patent applications categorized as business method patents increased to over 7,800 in 2000).

41 See Shapiro, *supra* note 10, at 1018.

42 See, e.g., Shapiro, *supra* note 10, at 1018 (stating that “[c]omplaints... allege that the... [USPTO] issues many questionable patents, for example, patents that are likely to be invalid or contain overly broad claims.”); Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 *Berkeley Tech. L.J.* 577, 577 (1999) (advancing recommendations to limit the issuance of bad patents likely to be issued due to the recognition of business method patents); James Gleick, *Patently Absurd*, *N.Y. Times Mag.*, Mar. 12, 2000, at 44 (claiming that “[w]ith software, where the nuts and bolts are vaporous and intangible, questions of what’s obvious and what’s novel begin to float in the wind.”) (emphasis added).

43 First Inventor Defense Act of 1999, Pub. L. No. 106-113, §§4301-4302, 113 Stat. 1501A, 555-57 (codified as amended at 35 U.S.C. §273 (2006)). See Evensen, *supra* note 10, at 1379-80 (arguing that small defendants in infringement claims “will most likely not be able to afford the discovery costs necessary to prove the [first inventor] defense by clear and convincing evidence, and thus, will still be subject to opportunistic business method patent licensing.”). See also Dreyfuss, *supra* note 10, at 272 (arguing that the First Inventor Defense does not go far enough in addressing business method patents).

44 35 U.S.C. §273(b)(1) (2006).

45 35 U.S.C. §273 (2006). See generally Barney, *supra* note 2 (analyzing implications of the AIPA prior user defense); see Thayne, *supra* note 2, at 880-85 (highlighting the limits and qualifications of the AIPA prior user defense).

46 Representatives Howard Berman and Rick Boucher introduced an unsuccessful bill in the House of Representatives in 2000 (H.R. 5364, 106th Cong. (2000)). The goal of the bill was to reduce the issuance of business method patents. See Kevin M. Baird, Note,

Business Method Patents: Chaos at the USPTO or Business as Usual?, 2001 U. Ill. J.L. Tech. & Pol’y 347, 358 (2001). The bill would also create a third-party opposition proceeding and amend section 103 of the Patent Act to create a rebuttable presumption of obviousness for business method patent applications. Id.

47 USPTO, Business Method Patent Initiative: An Action Plan, <http://www.uspto.gov/web/offices/com/sol/actionplan.html> (last visited June 9, 2007).

48 USPTO Class 705 Data, *supra* note 40. The number of Class 705 patents issued in 2004 was 289 as compared to 845 in 2000. Id.

49 See generally USPTO, Examination Guidelines for Computer-Related Inventions, <http://www.uspto.gov/web/offices/pac/compexam/examcomp.pdf> (last visited June 9, 2007) (making clear to patent officers that business methods and computer-related inventions are no longer to be considered a different subject matter but were to be treated like any other process claim).

50 *Ex parte Bowman*, 61 U.S.P.Q.2d 1669, 1671 (B.P.A.I. 2001).

51 Id.

52 Id.

53 See U.S. Const. art. I, §8, cl. 8 (granting Congress the power “[t]o promote the Progress of Science and useful Arts.”).

54 35 U.S.C. §§101-103 (2000). In essence, business methods are fully patentable as long as they satisfy these basic Patent Act requirements.

55 See, e.g., John A. Squires & Thomas S. Biemer, Patent Law 101: Does a Grudging Lundgren Panel Decision Mean that the USPTO is Finally Getting the Statutory Subject Matter Question Right?, 46 IDEA 561, 562 (2006) (asserting that “[the introduction of Bowman’s technological arts requirement] seemed intentionally designed to saddle an otherwise settled, permissive subject matter test with a value-laden view that so-called ‘business method’ patents in general, and financial service industry patents in particular, are not worthy of entrance to the patent office.”).

56 See *infra* Part III, discussing that both European and Japanese patent laws require a non-trivial inventive step in addition to computer-implementation.

57 See *infra* Part III.

58 *Ex parte Lundgren*, 76 U.S.P.Q.2d 1385, 1387 (B.P.A.I. 2005). This trend is evidenced by the patentability requirement in Europe and Japan for a technical or inventive step and the Bowman technological art requirement. *Ex parte Bowman*, U.S.P.Q.2d 1669, 1671 (B.P.A.I. 2001). However, Lundgren terminates the U.S. branch of this trend. See Squires & Biemer, *supra* note 55, at 579-80.

59 35 U.S.C. §101 (2000).

60 *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

61 *Lundgren*, 76 U.S.P.Q.2d at 1388.

62 Id. at 1387. The Lundgren Board gave the Bowman decision short shrift, noting only that the decision was not precedential.

63 Id. at 1386. See Christopher Cotropia, *Observations on Recent Patent Decisions: The Year in Review*, 88 *J. Pat. & Trademark Off. Soc'y* 46, 55-56 (2006); *eBay, Inc. v. MercExchange L.L.C.*, 126 S. Ct. 1837, 1842 (2006) (expressing concerns about business method patents).

64 See, e.g., Michael Crichton, *This Essay Breaks the Law*, *N.Y. Times*, Mar. 19, 2006, §4, at 13 (imploing the Supreme Court to reverse the trend towards approving patents over seemingly abstract ideas and principles); Andrew Pollack, *Justices Reach Out To Consider Patent Case*, *N.Y. Times*, Mar. 20, 2006, at C1 (reporting that patent experts believed or hoped that the Supreme Court had granted certiorari in a patent case in order to rein in patenting).

65 *eBay, Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837 (2006).

66 Id. at 1842 (Kennedy J., concurring).

67 Id.

68 *Metabolite Labs, Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354 (Fed. Cir. 2004), cert. granted in part, 126 S. Ct. 543 (2005), cert. dismissed, 126 S. Ct. 2921 (2006).

69 *Metabolite*, 126 S. Ct. at 2921.

70 Id. at 2921-22 (Breyer, J., dissenting).

71 Id. at 2925 (Breyer, J., dissenting).

72 Id. at 2927(Breyer, J., dissenting).

73 Id. at 2928 (Breyer, J., dissenting).

74 Id.

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

76 Id. at 184.

77 See generally Jack George Abid, *Software Patents on Both Sides of the Atlantic*, 23 *J. Marshall J. Computer & Info. L.* 815 (2005); Michael Guntersdorfer, *Software Patent Law: United States and Europe Compared*, 2003 *Duke L. & Tech. Rev.* 6; Timothy R. Holbrook, *The Treaty Power and the Patent Clause: Are There Limits on the United States' Ability to Harmonize?*, 22 *Cardozo Arts & Ent. L.J.* 1 (2005).

78 DiMatteo, *supra* note 10, at 27.

- 79 See, e.g., Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments--Results of the Uruguay Round, 33 I.L.M. 81 (1994), and Uruguay Round Agreements Act, Pub. L. No. 103-465, 108 Stat. 4809, 4814-19 (codified in scattered sections of 15, 17, 19, and 35 U.S.C.) (providing, among other things, minimum patent duration); World Intellectual Property Organization Copyright Treaty, Dec. 20, 1996, 36 I.L.M. 65 (1997), available at www.wipo.int/treaties/en/ip/wct/trtdocs_wo033.html (providing standards for protecting access-controlled digital information).
- 80 See *In re CFPH L.L.C.'s Applications*, [2005] EWHC 1589 (Pat), [2006] R.P.C. 5 [hereinafter CFPH Applications], available at <http://www.bailii.org/ew/cases/EWHC/Patents/2005/1589.html> (providing an estimate of EPO software and business method patent grants).
- 81 See Ford, *supra* note 22, at 49 (reporting that “[o]n July 7, 2005, the European Parliament voted overwhelmingly to reject” a proposed directive to harmonize E.U. law with respect to business method and software patents). Despite the assertions of advocates, the proposed directive would have expanded the coverage of business method and software patents in the E.U. See *infra* notes 187-192 and accompanying text. See also Mathew E. Fink, *Patenting Business Methods in Europe: What Lies Ahead?*, 79 *Ind. L.J.* 299, 316 (2004) (claiming that “[under the proposed directive,] an otherwise unpatentable invention, such as a business method, becomes patentable if at least one component of the invention makes a technical contribution to an art.”).
- 82 Paris Convention for the Protection of Industrial Property, Mar. 20, 1883, revised at Stockholm July 14, 1967, 21 U.S.T. 1583, 828 U.N.T.S. 305.
- 83 *Id.* art. 2.
- 84 *Id.*
- 85 Ford, *supra* note 22, at 89.
- 86 Patent Cooperation Treaty, June 19, 1970, 28 U.S.T. 7645, 9 I.L.M. 978.
- 87 Ford, *supra* note 22, at 93.
- 88 See Ford, *supra* note 22, at 85-90.
- 89 See Ford, *supra* note 22, at 86-87.
- 90 See Ford, *supra* note 22, at 86.
- 91 See Ford, *supra* note 22, at 88.
- 92 See Ford, *supra* note 22, at 92-93.
- 93 Convention on the Grant of European Patents, Oct. 5, 1973, 13 I.L.M. 268 [hereinafter EPC], available at <http://www.european-patent-office.org/legal/epc/e/ma1.html>.

- 94 Id. art. 64.
- 95 Id. art. 75.
- 96 See id. art. 65 (claiming that if the patent application is not filed in a language recognized as official, a country may require translation of the application before it gives the patent full legal status).
- 97 Id. art. 99.
- 98 Id. art. 102.
- 99 EPC, supra note 93, art. 106.
- 100 EPC, supra note 93, art. 21.
- 101 EPC, supra note 93, art. 106.
- 102 See CFPH Applications, supra note 80, ¶ 56 (stating that the EPO “has no jurisdiction over the patent law of the U.K. The EPO is not the European Court of Justice, and Parliament has not seen fit to confer such powers upon it. On matters of patent law the role of the EPO is persuasive, not prescriptive.”).
- 103 EPC, supra note 93, art. 112.
- 104 CFPH Applications, supra note 80, ¶ 56.
- 105 EPC, supra note 93, art. 52(1). Subtle obstacles to harmonization still exist. See Holbrook, supra note 77, at 9-10 (noting that the differences between the U.S. application of “utility” and “useful arts” requirements compared to Europe’s “industrial applicability” standard are likely to prevent complete harmonization).
- 106 EPC, supra note 93, art. 52(2).
- 107 EPC, supra note 93, art. 52(2)(a).
- 108 EPC, supra note 93, art. 52(2)(c).
- 109 EPC, supra note 93, art. 52(3) (emphasis added).
- 110 CFPH Applications, supra note 80, ¶ 130.
- 111 Case T-208/84, VICOM, 1987 E.P.O.R. 74 (EPO Tech. Bd. App. 1986) [hereinafter VICOM], available at <http://legal.european-patent-office.org/dg3/biblio/t840208ep1.htm>.

112 Id. at 76.

113 Id.

114 Id. at 78.

115 Id.

116 Id.

117 VICOM, supra note 111.

118 VICOM, supra note 111, at 81.

119 VICOM, supra note 111, at 79.

120 Case T-1002/92- 3.4.1, Queueing System/Pettersson, 1996 E.P.O.R. 1, 3-10 (EPO Tech. Bd. App. 1994) [hereinafter Queueing System], available at <http://legal.european-patent-office.org/dg3/biblio/t921002ex1.htm>.

121 Id. at 3.

122 Id. at 4-8.

123 EPC, supra note 93, arts. 52, 56.

124 35 U.S.C. §103 (2000). It is important to note that subsequent Boards of Appeal interpreted inventive step to have far greater content. See infra notes 136-139 and accompanying text.

125 Queueing System, supra note 120, at 1.

126 EPC, supra note 93, art. 56.

127 Queueing System, supra note 120, at 1.

128 Queueing System, supra note 120, at 7-10.

129 See VICOM, supra note 111, at 77 (claiming that “the invention furthermore confers a technical benefit namely a substantial increase in processing speed compared with the prior art.”).

130 Queueing System, supra note 120, at 8.

- 131 Queuing System, supra note 120, at 9.
- 132 Queuing System, supra note 120, at 9.
- 133 Case T 0931/95- 3.5.1, Pension Benefit Systems P'ship, [http:// legal.european-patent-office.org/dg3/pdf/t950931eu1.pdf](http://legal.european-patent-office.org/dg3/pdf/t950931eu1.pdf), at 8 (EPO Tech. Bd. App. 2000) [hereinafter Pension Benefit Systems].
- 134 Id. at 1.
- 135 Id. at 7.
- 136 Id. at 10.
- 137 Id. at 11.
- 138 Id.
- 139 Pension Benefit Systems, supra note 133, at 8-20.
- 140 Pension Benefit Systems, supra note 133, at 1.
- 141 Pension Benefit Systems, supra note 133, at 10.
- 142 Pension Benefit Systems, supra note 133, at 11; see also Case T-258/03- 3.5.1, Hitachi/Auction method, <http://legal.european-patent-office.org/dg3/pdf/t030258ep1.pdf>, at 6 (EPO Tech. Bd. App. 2004) (extending this logic by asserting that because any technical aspect including pen and paper would meet the technical character requirement, patentability must be determined on the basis of novelty and non-obviousness).
- 143 CFPH Applications, supra note 80.
- 144 CFPH Applications, supra note 80, ¶¶ 54-57.
- 145 CFPH Applications, supra note 80, ¶ 54.
- 146 CFPH Applications, supra note 80, ¶ 35.
- 147 CFPH Applications, supra note 80, ¶ 41.
- 148 CFPH Applications, supra note 80, ¶ 93.
- 149 CFPH Applications, supra note 80, ¶ 93.

150 CFPH Applications, *supra* note 80, ¶ 94.

151 CFPH Applications, *supra* note 80, ¶ 104.

152 Amazon.com, Inc. v. Barnesandnoble.com, Inc., 239 F.3d 1343 (Fed. Cir. 2001).

153 *Id.* at 1366.

154 See *supra* notes 110-132 and accompanying text.

155 See Pension Benefit Systems, *supra* note 133, at 1-2.

156 Opinion of the Economic and Social Committee on the ‘Proposal for a Directive of the European Parliament and of the Council on the Patentability of Computer-Implemented Inventions,’ 2003 O.J. (C 61) 154, 156-57, available at http://eur-lex.europa.eu/LexUriServ/site/en/oj/2003/c_061/c_06120030314en01540163.pdf.

157 Commission Proposal for a Directive of the European Parliament and of the Council on the Patentability of Computer-Implemented Inventions, at 4, COM (2002) 92 final (Feb. 20, 2002) [hereinafter Proposed Directive], available at http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/com/2002com2002_0092en01.pdf.

158 *Id.* at 4-5.

159 Alan Cane, Patently an EU Tangle, *Fin. Times*, Apr. 20, 2005, at 6, available at 2005 WLNR 12525337.

160 Divisive Software Patents Issue Not Dead Yet, *Irish Times*, Nov. 25, 2005, at 7, available at 2005 WLNR 19013317.

161 Proposed Directive, *supra* note 157.

162 Proposed Directive, *supra* note 157, at 6.

163 Proposed Directive, *supra* note 157, at 9.

164 Proposed Directive, *supra* note 157, at 9.

165 Proposed Directive, *supra* note 157, at 10.

166 Proposed Directive, *supra* note 157, at 10.

167 Proposed Directive, *supra* note 157, at 10.

168 See *supra* notes 152-155 and accompanying text.

169 Treaty Establishing the European Community, 1997 O.J. (C 340) 3, Nov. 10, 1997 [hereinafter EC Treaty].

170 Proposed Directive, supra note 157.

171 Proposed Directive, supra note 157, at 14.

172 Pension Benefit Systems, supra note 133, at 15.

173 Proposed Directive, supra note 157, at 14.

174 Pension Benefit Systems, supra note 133, at 15.

175 Proposed Directive, supra note 157, at 20.

176 Proposed Directive, supra note 157, at 20.

177 Proposed Directive, supra note 157, at 20.

178 See Pension Benefit Systems, supra note 133, at 17 (quoting EPO guidelines in stating that, “the examiner should disregard the form or kind of claim and concentrate on its content in order to identify the real contribution which the subject-matter claimed, considered as a whole, adds to the known art.”); Proposed Directive, supra note 157, at 14.

179 Pension Benefit Systems, supra note 133, at 17; Proposed Directive, supra note 157, at 16.

180 Pension Benefit Systems, supra note 133, at 17.

181 Proposed Directive, supra note 157, at 14.

182 Proposed Directive, supra note 157, at 14.

183 Proposed Directive, supra note 157, at 17.

184 See Proposed Directive, supra note 157 at 14 (emphasizing that article 4(3) of the Proposed Directive requires that the invention must be considered as whole without distinguishing between technical and non-technical aspects of the invention).

185 See Pension Benefit Systems, supra note 133, at 18-20.

186 See supra notes 133-142 and accompanying text.

187 CFPH Applications, supra note 80, ¶ 104.

188 Many open-source advocates strongly believe that all software patents are socially harmful. See *A Sorry Software Saga Killing the Directive Preserves a Fragmented System*, *Fin. Times U.K.*, July 7, 2005, at 18, available at 2005 WLNR 10640488 (noting that “[w]hat should have been a narrow technical debate was blown off course by the intervention of the ‘open-source’ community, which relies on the free exchange of ideas to develop software”).

189 Foundation for a Free Information Infrastructure (EUPAT Workgroup), *Europarl 2003-09-24: Amended Software Patent Directive*, <http://eupat.ffii.org/papers/europarl0309/europarl0309.en.pdf>, Jan. 6, 2005 [hereinafter *Amended Proposed Directive*].

190 *Id.* art. 2b.

191 *Id.*

192 *Id.* art. 3a.

193 *Id.* art. 4a.1.

194 *Id.*

195 See *VICOM*, *supra* note 111, at 74. Some observers expressed concern that the restrictions would disallow the patenting of computer-implemented inventions that do make technical contributions; see, e.g., Alex H. Horns, *The Protection of Software and the Crisis of the Patent System* 1, 8 (Feb. 9, 2004), <http://ipjur.com/data/040901SoftPat-10-FINAL.pdf> (commenting that adoption of the *Amended Proposed Directive*, *supra* note 189, would ban almost all computer-implemented signal processing inventions).

196 *Treaty Establishing a Constitution for Europe*, Dec. 16, 2004, 2004 O.J. (C 310) 1, 27, art. I-34.

197 *Id.*

198 Council of the European Union, *Proposal for a Directive of the European Parliament and of the Council on the Patentability of Computer-Implemented Inventions*, 2002/0047 (COD), May 24, 2004 [hereinafter *Common Position*], available at <http://register.consilium.eu.int/pdf/en/04/st09/st09713.en04.pdf>.

199 See *Cane*, *supra* note 159.

200 See *Nikki Tait*, *European Position is Left Patently Unclear*, *Fin. Times*, Sept. 21, 2005 at 11, available at 2005 WLNR 14824918.

201 See, e.g., *Cane*, *supra* note 159; *A Sorry Software Saga*, *supra* note 188, at 18 (claiming that the E.U. harmonization was “blown off course by the intervention of the ‘open-source’ community.”).

202 Foundation for a Free Information Infrastructure (EUPAT Workgroup), *E.U. Council 2004 Proposal on Software Patents*, (Sept. 14, 2004), <http://eupat.ffii.org/papers/europarl0309/cons0401/cons0401.en.pdf>.

203 See *supra* notes 152-155 and accompanying text.

204 Foundation for a Free Information Infrastructure (EUPAT Workgroup), *Why Amazon One Click Shopping is Patentable Under the Proposed E.U. Directive* (Oct. 1, 2003), <http://eupat.ffii.org/papers/eubsa-swpat0202/tech/eubsa-tech.en.pdf>. The CAFC eventually

rejected Amazon.com's "One-Click" patent claim for lacking novelty in *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1363 (Fed. Cir. 2001).

205 See Proposed Directive, *supra* note 157; Common Position, *supra* note 198.

206 See Amended Proposed Directive, *supra* note 189, art. 4a.

207 See CFPH Applications, *supra* note 80, ¶ 130 (noting that the number of such patents are in the neighborhood of 40,000).

208 See *supra* Part II; *infra* Part III.B.

209 See *supra* Part II.

210 See Karlin Lillington, *Divisive Software Patents Issue Not Dead Yet*, *Irish Times*, Nov. 25, 2005, at 7, available at 2005 WLNR 19013317.

211 *Id.* The Free Software Foundation Europe is credited with mobilizing thousands to campaign against the Proposed Directive. *Id.*

212 Charles Arthur, *Science & Technology: Not Such a Wizard Idea*, *Indep. (U.K.)*, Mar. 23, 2005, at 10, available at 2005 WLNR 4540327 (suggesting that Bill Gates, then CEO of Microsoft, pressured European heads of state into supporting the Proposed Directive).

213 Proposed Directive, *supra* note 157, at 9.

214 Proposed Directive, *supra* note 157, at 9.

215 See *supra* notes 152-155 and accompanying text.

216 See John F. Duffy, *Harmony and Diversity in Global Patent Law*, 17 *Berkeley Tech. L.J.* 685, 712 (2002) (stating that "[m]any provisions of Japanese patent law are simply translations of their German counterparts.").

217 B. Zorina Khan, *Property Rights and Patent Litigation in Early Nineteenth-Century America*, 55 *J. Econ. Hist.* 58, 59 n.4 (1995). This anecdote is likely apocryphal since Japan enacted its first patent law in 1885. A. Aoki et al., *Japanese Patent and Trademark Law* 17 (1976).

218 Tokkyoho [Patent Law], Law No. 121 of 1959 (Japan), as amended by Law No. 220 ch. 1 §2(1) of 1999 (Japan), [hereinafter *Japan Patent Law*], translated in World Intellectual Property Organization, *Patent Law* (Law No. 121 of April 13, 1989, as amended), available at http://wipo.int/clea/docs_new/en/jp/jp006en.html. In Europe, inventions must be "susceptible of industrial application." EPC, *supra* note 93, art. 52(1).

219 *Japan Patent Law*, *supra* note 218, §2(1).

220 Japanese Patent Office, *Examination Guidelines for Patent and Utility Model in Japan (Inventions in Specific Fields: Computer Software-Related Invention)*, pt. 7, ch. 1 (2000) [hereinafter *Software Guidelines*], translated in http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/Guidelines/PartVII-1.pdf. See also Japanese Patent Office, *Provisional Translation*:

Examination Guidelines for Patent and Utility Model in Japan (Inventions in Specific fields: Computer Software-Related Invention) [hereinafter Alternative Translation], translated in http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/txt/soft-e.txt (last visited June 9, 2007) (providing an alternative translation to Software Guidelines).

221 Japanese Patent Office, Examination Guidelines for Patent and Utility Model in Japan (Requirements for Patentability: Industrially Applicable Inventions), pt. 2, ch. 1, §1.1(4) (2000) [hereinafter Patentability Guidelines], translated in http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/Guidelines/PartII-1.pdf (emphasis added). See *id.* (stating that if an invention uses methods for doing business, the invention is not considered statutory because it does not utilize natural law). But see *id.* (“[E]ven if a part of matters defining an invention stated in a claim does not utilize a law of nature, when it is judged that the claimed invention as a whole utilizes a law of nature, the claimed invention is deemed as utilizing a law of nature.”).

222 *Id.* §1 (citing Japan Patent Law, *supra* note 218, §2(1)) (emphasis added).

223 See EPC, *supra* note 93, art. 52(c) (excluding “schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers” from patent eligibility).

224 See *supra* Part III.A.2.

225 Software Guidelines, *supra* note 220, §§1.2, 1.2.1, 1.2.2, 2.2, 2.3.

226 See Software Guidelines, *supra* note 220, §§1.2, 1.2.1, 1.2.2.

227 Japan Patent Law, *supra* note 218, §36(4); see also Software Guidelines, *supra* note 220, §1.2.1.

228 Software Guidelines, *supra* note 220, §1.2.2.

229 Alternative Translation, *supra* note 220, §1.2.2(1).

230 Alternative Translation, *supra* note 220, §1.2.2(1).

231 Software Guidelines, *supra* note 220, §1.2.2(1).

232 Software Guidelines, *supra* note 220, §2.2.

233 Software Guidelines, *supra* note 220, §2.2.3(1).

234 Alternative Translation, *supra* note 220, ch. 1 (defining in the introductory definitions a program listing as a “representation of program codes by means of printing them on paper, displaying them on a screen, etc.”).

235 Software Guidelines, *supra* note 220, §2.2.1.

236 Software Guidelines, *supra* note 220, §3(2)(a)-(b).

- 237 Software Guidelines, supra note 220, §2.3.1(1).
- 238 Software Guidelines, supra note 220, §2.3.1(5).
- 239 Software Guidelines, supra note 220, §2.3.4.
- 240 Software Guidelines, supra note 220, §2.3.4(1)-(6).
- 241 Software Guidelines, supra note 220, §2.3.4(1) (In cases having a common procedure or means for realizing a function is software-related inventions, “it is within the ordinary creative activity expected of a person skilled in the art to apply such procedure or means of software-related inventions used in certain applied fields to other fields to realize the same function or operation.”).
- 242 Software Guidelines, supra note 220, §2.3.4(2).
- 243 Software Guidelines, supra note 220, §2.3.4(4).
- 244 Software Guidelines, supra note 220, §2.3.4(4).
- 245 Japanese Patent Office, Major Judicial Precedents of Business Method-Related Inventions 1-2, http://www.jpo.go.jp/shiryou_e/s_sonota_e/pdf/gizyutu_hanketu_e/materials_01.pdf (last visited June 9, 2007).
- 246 Id. at 3-4.
- 247 Id. at 4-5.
- 248 Id. at 4.
- 249 Software Guidelines, supra note 220, §2.3.5.
- 250 Software Guidelines, supra note 220, §2.3.5.
- 251 Japanese Patent Office, Outline of the Industrial Property Right System, http://www.jpo.go.jp/seido_e/s_gaiyou_e/4houe.htm (last visited June 9, 2007).
- 252 Id.
- 253 See Japanese Patent Office, Policies Concerning “Business Method Patents,” (2000), http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/tt1211-055.htm (noting that for example “the [Trilateral patent] offices also confirmed items including mere automation of a business process that had been known as a manual process, by way of using a well-known method is not considered patentable.”).
- 254 See Japanese Patent Office, Japan Patent Office Annual Report 2002, pt. 1, ch. 2, at 9-16 (Feb. 2003), http://www.jpo.go.jp/shiryou_e/toushin_e/kenkyukai_e/pdf/04-chapter2.pdf (stating that “[c]reation of software shall fall under

inventions provided in the Patent Law if hardware and software are used as a unit to concretely realize an idea.”).

255 Hideo Furutani, Japanese Patent Attorney, Furutani Patent Office, Address to the USPTO: Patentability of Business Method Inventions in Japan Compared with the U.S. and Europe 12-13 (Nov. 3, 2003), http://www.furutani.co.jp/office/ronbun/Business_method_patents_in_Japan.pdf.

256 Japanese Patent Office, *supra* note 251.

257 See *supra* notes 64-75 and accompanying text.

258 See *supra* Part III.

259 See *supra* notes 202-206 and accompanying text.

260 See, e.g., Heinz Bardehle, Patent Harmonization: Quo Vadis?, 88 J. Pat. & Trademark Off. Soc’y 644, 644 (2006); Remigius N. Nwabueze, Ethnopharmacology, Patents and the Politics of Plants’ Genetic Resources, 11 Cardozo J. Int’l & Comp. L. 585, 585-86 (2003); World Intellectual Property Organization, Proposal from the United States of America, Japan and the European Patent Office Regarding the Substantive Patent Law Treaty (SPLT), SCP/10/9, Apr. 22, 2004, www.wipo.int/edocs/mdocs/scp_10/scp_10_9.doc.

261 See DiMatteo, *supra* note 10, at 22-25 (reviewing some of the public policy rationales offered for positions for and against the recognition of business method patents).

262 Lee B. Burgunder, *Legal Aspects of Managing Technology* 183-84 (4th ed. South-Western Educ. Publ’g 2006).

263 See, e.g., Charles W. Almer, Vice President, Warner-Lambert Co., Report at the Symposium Commemorating the Centennial of Japan’s Accession to the Paris Convention: A U.S. Corporation Wish List for Future Patent Systems (Nov. 16, 1999), http://www.jpo.go.jp/shiryou_e/toushin_e/kenkyukai_e/walmer.htm (stating that “global companies today desire and expect a consistent ‘global’ IP system.”).

264 See *supra* Part III.

265 See, e.g., Robert E. Thomas, Vanquishing Copyright Pirates and Patent Trolls: The Divergent Evolution of Copyright and Patent Laws, 43 Am. Bus. L.J. 689, 723-25 (2006) (noting that the patent troll problem led large technology companies to push for patent reform in Congress).

266 See *supra* notes 64-75 and accompanying text.

267 See generally William D. Nordhaus, *Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change* 70-90 (MIT Press 1969) (analyzing the tradeoff between patents’ enhanced incentives and the reduction in competition due to patent exclusivity); but cf. Evans & Layne-Farrar, *supra* note 4, at 27-28 (rejecting the elimination of software patents as draconian while arguing that problems with software patents are merely procedural).

268 U.S. Const. art. I, §8, cl. 8.

269 Commentators are very careful to avoid characterizing intellectual property rights as monopolies. See, e.g., Daniel R. Cahoy,

Changing the Rules in the Middle of the Game: How the Prospective Application of Judicial Decisions Related to Intellectual Property Can Promote Economic Efficiency, 41 *Am. Bus. L.J.* 1, 8 n.18 (2003) (commenting that “[o]ne of the most common errors is in describing intellectual property rights as ‘monopolies.’”). However, in a narrowly defined market for a valuable product with no close substitutes, a patent does in essence grant monopoly powers to the patent holder.

270 See, e.g., Nordhaus, *supra* note 267, at 86-90 (analyzing the welfare implications of patent monopolies); Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 *Harv. L. Rev.* 1813, 1887-88 (1984) (emphasizing the importance of considering the net social benefit as opposed to gross social benefit in applying cost-benefit analysis to patents).

271 See Edwin Mansfield, *Patents and Innovations: An Empirical Study*, 32 *Mgmt. Sci.* 173, 173-81 (1986) (asserting that the lack of patents do not deter innovation in many industries).

272 See Adam B. Jaffe & Josh Lerner, *Innovation and Its Discontents: How our Broken Patent System is Endangering Innovation and Progress, and What to do About it* 201 (Princeton Univ. Press 2004) (stating that “software innovation was flourishing before the 1980s, when the CAFC clarified and broadened the patentability of software. This seems to show that patents for software are not necessary”); CFPH Applications, *supra* note 80, ¶ 35 (stating that “it is worth noting that the software industry in America developed at an astonishing pace when no patent protection was available”).

273 See Jaffe & Lerner, *supra* note 272, at 202. See, e.g., Dennis M. Ritchie, *The Evolution of the Unix Time-Sharing System* 63, AT&T Bell Labs. Technical J. 1577 (1984), available at <http://cm.bell-labs.com/cm/cs/who/dmr/hist.html> (chronicling the patentless creation and distribution of the Unix operating system, which, with the exception of Microsoft operating systems, is the foundation for most major operating systems including Apple’s OSX and Linux); Marshall Kirk McKusick, *Twenty Years of Berkeley Unix from AT&T-Owned to Freely Redistributable*, in *Open Sources: Voices from the Open Source Revolution* (Chris DiBona et al. eds., O’Reilly Media 1999). See also *supra* Part II (describing how legal recognition of software patents developed gradually from the 1960s).

274 See Laurence Lessig, *Code and Other Laws of Cyberspace* 102-05 (Basic Books 2000) (describing the development of the Internet from mostly Open Source technologies).

275 See James Bessen & Eric Maskin, *Sequential Innovation, Patents, and Imitation* 7 (Mass. Inst. of Tech. 2006), <http://sss.ias.edu/publications/papers/econpaper25.pdf> (maintaining that for sequential and complementary technologies, imitation spurs innovation, whereas strong patent protection impedes innovation).

276 Evensen, *supra* note 10, at 1366 (quoting Rizzo, *supra* note 18, at 363).

277 See Andre J. Porter, *Should Business Method Patents Continue to Be Patentable?*, 29 *S.U. L. Rev.* 225, 242 (2002) (noting that the USPTO traditionally failed to keep prior art databases for business methods); Cohen & Lemley, *supra* note 16, at 12-13 (making a similar observation with respect to software patent applications). One of the reasons for the lack of prior art databases in this area is that many business and financial institutions maintained business methods as trade secrets prior to *State Street Bank*. See Jaffe & Lerner, *supra* note 272, at 117.

278 See Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 *J.L. & Econ.* 265, 275-80 (1977).

279 See Cohen & Lemley, *supra* note 16, at 41.

280 Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 *Colum. L. Rev.* 839, 839 (1990) (noting that “the economic significance of a patent depends on its scope: the broader the scope, the larger the number of competing products and processes that will infringe the patent.”).

281 Merges & Nelson, *supra* note 280, at 843-44. See also Alan Greenspan, Chairman, Fed. Reserve, *Remarks at the Stanford Institute*

for Economic Policy Research Economic Summit: Intellectual Property Rights 3 (Feb. 27, 2004) (querying “[a]re the protections sufficiently broad to encourage innovation but not so broad as to shut down follow-on innovation?”), available at <http://www.federalreserve.gov/boarddocs/speeches/2004/200402272/default.htm>.

282 When an invention is similar to another invention, but falls outside the scope of a patent, it may be infringing under the doctrine of equivalents if the court decides that the differences are not substantive. For example, an invention may substitute a different chemical for a chemical in the same chemical family or an inert ingredient for a listed inert ingredient. Since these substances were not included in the patent claim, the invention technically does not infringe even though in reality it is the same invention. In such cases, the court denies the defenses and finds infringement under the doctrine of equivalents. See Burgunder, *supra* note 262, at 148-50; Merges & Nelson, *supra* note 280, at 853.

283 Cohen & Lemley, *supra* note 16, at 24; *supra* Part III.A.

284 This disclosure is part of the explicit bargain that inventors enter into in exchange for patent rights. See Cohen & Lemley, *supra* note 16, at 24.

285 Cohen & Lemley, *supra* note 16, at 24-25.

286 Cohen & Lemley, *supra* note 16, at 25.

287 See Thomas, *supra* note 265, at 723-25.

288 See Cohen & Lemley, *supra* note 16, at 25-26.

289 The reverse doctrine of equivalents provides a defense against infringement when the new invention is a significant improvement over the plaintiff’s patent. See Cohen & Lemley, *supra* note 16, at 23.

290 Such rulings can result in major shifts in corporate strategy. See *Eolas v. Microsoft*, 399 F.3d 1325 (Fed. Cir. 2005), cert. denied, 126 S. Ct. 568 (2005) (recounting how an Eolas patent caused Microsoft to institute substantial changes to the design of its Internet Explorer web browser out of fear that the courts would eventually sustain an adverse district court judgment); see also Thomas, *supra* note 265, at 705-06 (discussing the indirect impact on developers who were forced to rewrite their software at great expense in order to accommodate changes in Internet Explorer).

291 See Cohen & Lemley, *supra* note 16, at 3-4 (noting that “[w]ith some eighty thousand software patents already issued, the Federal Circuit endorsing patentability without qualification, and the Supreme Court assiduously avoiding the question, software patentability is a matter for the history books.”).

292 Judging by the size of infringement awards, some businesses are clearly profiting from business method and software patents. See, e.g., Declan McCullagh, Microsoft, Oracle Call for Patent Reform, ZDNet, Apr. 25, 2005, http://news.zdnet.com/2100-9588_22-5683240.html (reporting that Microsoft pays \$100 million a year to defend against about 40 “patent troll” claims).

293 *Id.*

294 See Thomas, *supra* note 265, at 724-25.

295 See James Q. Wilson, *The Politics of Regulation*, in *The Politics of Regulation* 357 (James Q. Wilson ed., 1980). See, e.g., *supra* note 205 and accompanying text (describing the role of organized interest groups in successfully blocking E.U. efforts to expand

patent coverage for business methods and software). See also Thomas, *supra* note 265, at 722-33 (observing that there are strong targeted interest groups on both sides of the patent reform battle suggesting that major reforms are unlikely to occur.).

296 See *supra* Part III.

297 This test is the one that the EPO employs. See *supra* notes 124-126 and accompanying text.

298 See *supra* notes 139-142 and accompanying text. Japan grants patents on business methods if they involve a creation of technical ideas and such claims must make a technical advancement or contribution. See *supra* notes 217-219.

299 Jeff Bezos, Open Letter from Jeff Bezos on the Subject of Patents, Mar. 9, 2006, http://www.oreilly.com/news/amazon_patents.html.

300 Council Directive 96/9, 1996 O.J. (L 77) 20 (EC).

301 See, e.g., Henry Grabowski, Pharmaceuticals: Politics, Policy and Availability: Patents and New Product Development in the Pharmaceutical and Biotechnology Industries, 8 *Geo. Pub. Pol'y Rev.* 7, 9 (2003) (“It takes several hundred million dollars to discover, develop and gain regulatory approval for a new medicine.”); Atul Nerkar et al., Business Method Patents as Real Options: Value and Disclosure as Drivers of Litigation, 16 (Nov. 2006) (unpublished manuscript on file with the authors) (noting that “[t]he costs of developing an idea that will lead to the filing and subsequent grant of a business method patent are correspondingly lower than those associated with physically intensive sectors such as chemicals, pharmaceuticals and semiconductors.”).

302 See Bessen & Maskin, *supra* note 275, at 7 (maintaining that patents impede innovation for sequential and complementary innovations such as software development).

303 See Thomas, *supra* note 265, at 723-25.

304 Patent law requires applicants to describe their invention in such detail as to enable others to make and use it, as well as “set forth the best mode contemplated by the inventor of carrying out his invention.” 35 U.S.C. §112 (2000).

305 See EPC, *supra* note 93, art. 5; Japan Patent Law, *supra* note 218, arts. 113-15.

306 See, e.g., Evensen, *supra* note 10, at 1383-91 (suggesting the creation of a patent validity court that independently evaluates patent prior art for pending patent claims).

307 See *supra* Part III.

308 The Japanese approach, while similar to that of Europe, is more lenient issuing patents on many claims that the EPO would reject. See *supra* note 255 and accompanying text.

309 See *supra* note 156 and accompanying text.

310 See *supra* notes 152-155 and accompanying text.

311 See supra Part III.

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