I. INTRODUCTION

In August 2011, Google announced plans to acquire Motorola Mobility and its 17,000 patents for $12.5 billion. Two months earlier, a consortium of companies lead by Microsoft and Apple purchased 6,000 patents from Nortel Networks for $4.5 billion. While patent holdings were once rarely more than a footnote on a company’s valuation, today, industry has come to realize their tremendous importance. Despite this importance, legal systems worldwide are struggling to define what exactly should qualify for patentability. This struggle is especially pronounced in the field of software patents where the line between patentable invention and unpatentable subject matter becomes quite blurred. This paper discusses the current availability of software patents in the United States, Europe, Japan, China and India.

A patent is a set of exclusive rights granted to an inventor, including the sole right to make, use, sell and profit from an invention. The grant is limited to a certain period of time, most often 20 years from the effective application filing date. After the term expires, others are free to use the invention without restriction. A patent is granted by a specific government and is limited to that country. Therefore, an inventor must file for a patent in each country that he wishes to protect his invention in. A patent granted by the United States Patent Office, for
example, does not prevent a copier from manufacturing an invention in Japan and selling it to Japanese consumers. To prevent the invention’s manufacture in Japan, the inventor must apply for and receive a Japanese patent in addition to his U.S. patent.

Generally, patents are granted for new, useful and non-obvious processes and machines. Mathematical formulas, laws of nature and other abstract ideas are normally not considered inventions and are thus not patentable. Every country, however, defines the exact scope of patent law differently.

II. PATENTS AND COPYRIGHTS PROVIDE DIFFERENT TYPES OF PROTECTION

While patents must be applied for, copyright law protects all software the moment the code is fixed in a tangible medium, e.g., typed into a computer. Copyright protection is not predicated on registration or any other formality and the protection often lasts for over 100 years. The scope of the protection, however, is more limited than patent protection. Copyright only protects specific creative expression. Accordingly, copyright law protects the specific code a programmer writes, but it does not protect the ideas behind that code and it does not prevent anyone from recreating similar functionality using their own code. Patent law, on the other hand, prevents others from implementing patented functions even if they arrived at those functions without any idea that someone else already invented and patented them. Thus, while it is much harder to obtain a patent than a copyright, patents offer much broader protection for a software inventor.
III. SOFTWARE PATENTS IN THE UNITED STATES

Beginning in the 1980s, software patents were widely available in the United States. The *Bilski* case, first decided by the Court of Appeals for the Federal Circuit (CAFC) in 2008\(^1\) and then modified by the Supreme Court in June of 2010,\(^2\) limited this wide availability. While *Bilski* affirmed that some software is patentable, it emphasized that patents had been granted too freely and that software patents should be evaluated against a stricter standard. In *Bilski*, the Supreme Court held that the “machine-or-transformation” test is a “clue” as to the patentability of software, but it left the specific contours of the standard murky.\(^3\) To understand how this new “machine-or-transformation” standard will be implemented, it is instructive to briefly trace how the law has developed.

There is no specific statutory provision that allows the United State Patent and Trademark Office (PTO) to issue software patents. Upon passage of the 1952 Patent Act, however, Congress directed that “anything under the sun that is made by man” may qualify for a patent.\(^4\) In 1981, the Supreme Court echoed this phrase when, for the first time, it held that an invention that utilized computer code was patentable.\(^5\) The Court, nevertheless, stressed an

\(^1\) *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008).


\(^3\) *Id* at 3227.


important qualification: Many things “under the sun,” including natural phenomenon, abstract ideas and mathematical laws are not “made,” but are discovered. The Court repeated its early holdings that an invention based on a mathematical algorithm is not patentable unless it offers “some other inventive concept.”6 The Court made a fine distinction that “insignificant post solution activity will not transform an unpatentable principle [like an algorithm] into a patentable process,” but a process that includes an algorithm is patentable if it otherwise falls within patent law’s scope of protecting processes that transform or reduce “an article to a different state or thing.”7

Over the ensuing two decades this qualification against the patenting of algorithms was weakened. In 1998, the CAFC held that software is patentable if “it produces a useful, concrete and tangible result.”8 This easy to meet rule was the governing standard until 2008 when the CAFC overturned itself in Bilski. The patent claims at issue in Bilski did not require the use of software or computers, but were a “business method” for hedging risk in commodities trading. Bilski is relevant because both business methods and software are governed by the rules for “process” patents. In Bilski, the CAFC held that a process (including software related inventions or computer code) is patentable only if “(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.”9 This “machine-or-transformation test” is intended to identify and exclude abstract ideas that are not patent eligible. For example,

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6 Id at 204 citing Parker v. Flook, 437 U. S. 584, 591-95 (1978).
7 Id at 192. (Internal citations omitted.)
9 In re Bilski, 545 F.3d 943 at 545.
after Bilski, the PTO Board of Appeals ruled that a “method of controlling processing of data” in a database is an abstract idea that falls outside the scope of patent protections. On the other hand, a method for tuning Bluetooth headsets, for example, and a device that makes a video game controller vibrate, are likely to survive the machine-or-transformation test because their software component is closely interconnected with a physical invention.

In 2010, in an appeal from the CAFC Bilski decision, the Supreme Court adopted the machine-or-transformation test, but cautioned that it is not the sole test for determining the patentability of software and other processes, but rather “a useful and important clue.” Since the Supreme Court ruling, the PTO has wrestled with implementation. Its most recent guidelines clarify that the ultimate issue is still whether the application seeks a monopoly on an abstract idea. In most cases the “machine-or-transformation test” will be determinative, “but in some rare cases, factors beyond those relevant to machine-or-transformation may weigh for or against a finding” that a claim is impermissibly attempting to patent an abstract idea.

While Bilski confirmed that some software is patentable, it has made it more difficult to get new software patents. On the other hand, Bilski has not caused a flood of patent invalidations. On June 9, 2011, the Supreme Court reiterated that “clear and convincing

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evidence” is required to demonstrate the invalidity of an existing patent. Considering how poorly defined the current standards for software patents are, without further judicial clarification it will remain difficult for litigation defendants to meet this “heavy burden of persuasion” and invalidate existing patents.

In August 2011, the CAFC offered insight into the post-*Bilski* standard for software patent invalidations. In *CyberSource Corp. v. Retail Decisions, Inc.*, the court affirmed the invalidation of a patent for “a method for verifying the validity of a credit card transaction over the Internet.” The court explained that this fraud detection method was an unpatentable mental process because all the steps could “be performed in the human mind, or by a human using a pen and paper.” The court was not persuaded by the appellant’s attempt to tie the fraud detection process to a particular machine -- the Internet -- and thus pass the machine prong of the “machine-or-transformation” test. The court explained that adding “mere data-gathering steps” involving the Internet does not change the fundamental nature of the method and make it patentable.

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16 Id.


18 Id at *5 (internal citations omitted).

19 Id at *3.
IV. SOFTWARE PATENTS IN EUROPE

There is no singular European patent system. Patent enforcement must be litigated in each, individual, national court system. Nevertheless, the European Patent Office (EPO) provides inventors the ability to file a single “European patent” application, which, if granted provides a bundle of national patents. Accordingly, while there are a host of specific national issues relating to software patents, a primary concern is how the EPO interprets and implements its founding document, the European Patent Convention (EPC).

Article 52(1) of the EPC defines the broad scope of patentable inventions: “European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.” (Italics added.) Article 52(2) narrows this scope by excluding, among other things, “mathematical methods,” “rules and methods for performing mental acts . . . or doing business, and programs for computers.” (Italics added.) Article 52(3), however limits this exclusion “to the extent to which a European patent application . . . relates to such subject-matter or activities as such.” (Italics added.) The tension between the inclusion of “all fields of technology” and the exclusion of “programs for computers” combined with the ambiguity of the qualifier “as such” forms the basis for the EPO treatment of software patents applications.

The EPO has settled this tension by interpreting the “as such” provision to limit the exclusion of, for example, programs for computers in their abstract form only. As long as an invention carries out some minimal “technical process,” and regardless of whether the dominant

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20 The only European countries who are not members of the European Patent Office are Belarus, Moldova, Russia and Ukraine. Bosnia and Herzegovina and Montenegro will recognize European patents upon request.
feature is abstract and excluded, then it qualifies for a European patent. Although the definition of “technical process” can be elusive, some EPO decisions can guide us. For example, the EPO ruled that a novel “digital image processing” method was patentable because it involved “‘real world’ activities that started in the real world (with a picture) and ended in the real world (with a picture).” The EPO reasoned that a digital image filter should enjoy the entire protection physical image filters already enjoy. Similarly, a system that controlled X-ray equipment qualified as a patentable technical process because the software controlled a process that culminated in a physical result, the X-ray. Likewise, software that improves the operation of a computer, like an improved method for storing data in memory, is patentable because the improved invention, the computer, is physical.

On the other hand, the EPO determined that a “method of estimating sales activity” is an excluded business method that fails to achieve a technical process. The estimation method was an abstract algorithm that, although it was implemented using computer hardware and software, had no real world technical effect. Similar to the US Federal Circuit decision in *CyberSource* (discussed above), implementing a business process or other idea with the assistance of a computer does not, by itself, transform a non-patentable abstract method into a patentable technical process. Accordingly, a software program for calculating currency exchange rates, a

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21 T 0208/84 (Computer-related invention) (1986).


23 T 1194/97 (Data structure product) (2000).


program for visualizing business data in charts or graphs, and a word processing program are not patentable because they lack a technical step.

In 2002, there was an effort in the European Parliament to clarify the law, make computer software more clearly patentable and to harmonize how the national courts dealt with European software patents after they were granted by the EPO. This effort provoked a counter-movement to clarify the law in the direction of eliminating software patents. Neither proposal won enough support to be enacted. EPO President Alison Brimelow referred questions to the Enlarged Board of Appeal in 2008 hoping to reconcile the various court rulings on the patentability of computer-implemented inventions (software). In 2010, the Enlarged Board declined to take a position, deciding that the referral is inadmissible because there is not sufficient divergence of existing EPO case law. Today, all signs suggest that the status quo, as unclear as it is, will continue.

V. SOFTWARE PATENTS IN JAPAN

Japan has embraced software patents with few limitations. Software can be patented in many forms whether it is defined as a device, process, medium, computer program or data construction.

Article 2(1) of the Patent Act defines the scope of patentable inventions as any “advanced creation of technical ideas utilizing a law of nature.” Excluded from patentability are six non-

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statutory inventions: (1) A law of nature as such; (2) Mere discoveries and not creations; (3) Those contrary to a law of nature; (4) Those in which a law of nature is not utilized; (5) Those not regarded as technical ideas; and (6) Those for which it is clearly impossible to solve the problem to be solved by any means presented in a claim. At first glance, this list of non-statutory inventions appears to preclude software, which an inventor or lawyer accustomed to the American and European approaches thinks of as abstract and not technical in and of itself. Nevertheless, the official Examination Guidelines for Patent and Utility Model in Japan explains that when “information processing by software is concretely realized by using hardware resources, the said software is deemed to be a creation of technical ideas utilizing a law of nature.”

As the guidelines assert, the key factor is often whether the invention is realized with the use of a machine. This requirement is easy to meet in the case of software, because software is designed for pairing to a physical computer. Likewise, under this standard, a business method that is coded into software, which is run on hardware, is patentable.

Japan’s courts have repeatedly affirmed the Japan Patent Office’s support for the patentability of software. The most common reason for the courts to strike down a software patent is because the invention failed to rise above “the exercise of ordinary creative activity

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expected of a person having ordinary” programming or business skill.\textsuperscript{31} Accordingly, computerizing a well-known business method will not lead to a patent on the method. Patents are only available for novel inventions.

VI. SOFTWARE PATENTS IN CHINA

In 1984, China enacted its first patent law. In 2000, this law was greatly expanded. Today, Chinese patent law mostly mirrors European Patent law.\textsuperscript{32} Structurally, however, there is a major distinction: China has no case law system. Patent eligibility is defined by the Patent Law, its Implementing Regulations, and the Examination guidelines promulgated by the Chinese State Intellectual Property Office (SIPO).

Adopting the European “as such” rule, SIPO guidelines state that “Computer programs as such cannot be patented.”\textsuperscript{33} The guidelines go on to explain that an “invention containing a computer program may be patentable if the combination of software and hardware as a whole can really improve prior art, bring about technical results and constitute a complete technical solution.”\textsuperscript{34} This “technical solution” requirement originates from the definition of “invention”


\textsuperscript{32} This is due, impart, to the fact that the Chinese State Intellectual Property Office was created with help from the German Patent and Trademark Office.


\textsuperscript{34} Id.
in Rule 2 of the Chinese Implementing Regulations.\textsuperscript{35} As in European patent law, however, neither “technical results” nor “technical solution” is defined.

In practice, it is relatively easy to obtain a software patent in China. All that is required is novelty and some very minimal technical effect. While pure business methods are still unpatentable abstract ideas, over the last decade, SIPO has become increasingly generous with its definition of “technical solution.”

\textbf{VII. SOFTWARE PATENTS IN INDIA}

Indian software patent law is not well settled and there are no court decisions to guide us. In this vacuum, many Indian software creators believe that India does not issue software patents. This view, however, is wrong. The Indian Patent Act prohibits certain kinds of software patents, but the contours of the prohibition are unresolved. While there has been much public debate over how the Patent Act should be interpreted or amended, the India Patent Office has quietly, and continuously, granted software patents along European precedents.

Section 3(k) of India’s Patent Act excludes “a mathematical or business method or a computer program per se or algorithms” from patentability. In 2004, an amendment to the Patent Act was proposed that would have specifically allowed computer programs to be patented in their “technical application to industry or [when in] combination with hardware.” This amendment was rejected after facing strong opposition from groups opposed to software patents.

The effect of this rejection is unsettled. Patent opponents assert that the rejection means that India does not recognize software patents. The India Patent Office, however, has not embraced this assertion.

In 2008, the India Patent Office released the Draft Manual of Patent Practice and Procedure. As discussed below, this manual has since been revised. It is useful to review the 2008 draft manual because it explains what the law was and how it is shifting. The draft manual cited several European Patent Office decisions and even borrows the “as such” qualifier, which is familiar to those versed in the Europe Patent Convention. Following the rough outline of European patent precedent, Section 4.11.5 of the draft manual distinguished between three kinds of software patent claims. It directed that a “Computer program product,” a piece of pure software, is excluded from patentability under the “per se” language of Section 3(k). The draft manual counseled, however, that “method/process” and “apparatus/system” software inventions are patentable.

When the draft manual was released in 2008 there were significant protests that the Patent Office was overstepping its power and expanding the Patent Act in a manner that the Parliament had refused to do. In March of 2011, the India Patent Office released the Manual of Patent Office Practice and Procedure, which greatly revised the software section of the draft

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37 Id at 73.

manual. While the draft manual pronounced the wide scope of software patent availability, the 2011 manual takes a less assertive view that hugs Section 3(k)’s ambiguity.

In line with Section 3(k) of the Patent Act, Section 08.03.05.10 (a)-(d) of the 2011 manual advises that mathematical methods “in any form,” business methods including the “whole gamut of activities in a commercial or industrial enterprise relating to transaction of goods or services” and algorithms “in all forms” are not patentable subject matter. The manual cautions that a “claimed invention is sometimes camouflaged as one relating to the technological development” or as having “some technical features such as internet, networks, satellites, telecommunications etc.,” but that such claims do not lead to patentability if the “substance” of the claim relates to a mathematical method, business method or algorithm. Thus, at first read, the manual appears to take a hard line against the grant of software patents. Nevertheless, Section 08.03.05.10 (f) of the manual leaves an opening allowing certain software patents in a manner akin to European and American law. Subsection (f) counsels that if an application contains a patentable “subject matter that is sufficiently disclosed in the specification and forms an essential part of the invention,” then the invention is patentable notwithstanding the inclusion of a computer program.

Indeed, Indian groups opposed to software patents have been loudly complaining that despite the strong language of the 2011 manual, the Patent Office is granting, albeit inconsistently, heaps of software patents. This claim has support. Two out of the 13 new patent

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39 Id at 92-3.
40 Id.
grants recorded in the July 2011 issue of the India Patent Office Official Journal\(^{41}\) are, arguably, software patents more in step with the retracted 2008 draft manual than the current 2011 manual: one is a Research in Motion patent for *Method and Apparatus for Efficient Network Scanning*\(^{42}\) and the other is *A Home Location Register System of Supporting Multi of Network Type User*\(^{43}\) granted to the Chinese telecommunications company ZTE. The trend of granting international companies Indian patents for inventions that have already received European patents is well established and shows no signs of abating.

**VIII. CONCLUSION**

Patent protection for software is available to those who are able to successfully navigate the regulations of each country where protection is sought. As the value of software patents becomes clear, the importance of drafting a patent application that includes software protection in as many places as possible has become more pronounced. Inventors need to collaborate with lawyers who posses both great technical knowledge and experience navigating the various, and poorly defined, guidelines that exist in the various worldwide patent systems.


\(^{42}\) India Patent No. 248062.

\(^{43}\) India Patent No. 248063.