

Software patents offer opportunities and obstacles

'State Street' sparked a boom in PTO and court filings, and the dust has not quite settled.

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As the aftershock of State Street¹ subsides, the avalanche of new software patent issuances and litigation begins. Many in the computer industry have responded in force to the challenges and threats posed by this monumental change in patent law. Software patents provide strategic value to companies, but the procurement and assertion of these powerful assets can be fraught with risks.

Unlike most technology, software was denied patent protection in the early years of its development. Even now, less than two decades since the advent of personal computers, software patents constitute a rapidly growing but still small portion of newly issued patents, compared to more established technological arts.

For decades, the U.S. Patent and Trademark Office (PTO) and federal courts treated software as mathematical algorithms, in the same category as laws of nature, natural phenomena and abstract ideas. A transformation of numbers from binary-coded decimal to binary representations, for example, was held not entitled to patent protection.² Similarly, business methods were deemed mere extensions of human activities, also ineligible for patent protection.

The computer industry had to rely primarily on trade secret and copyright law for protection. A copyright, although easy to obtain, covers only the expression of an idea--the particular program code and close equivalents, but not the underlying idea itself, regardless of the particular expression. The difficulty of trade secrets for software is maintaining the technology as a secret in a mass-produced product that is subject to reverse engineering and hacking.

Since the 1980s, a mosaic of cases has sought to provide a framework for assessing the eligibility of patent applications having claims incorporating mathematical algorithms. The guidelines were confusing and contradictory. Nonetheless, some software inventions, by being integral parts of a device or permissible processes, made it through the patent gauntlet and were licensed for considerable sums. The first software patents derived in this way began to be litigated only a few years ago. The explosive growth of the Internet and e-commerce, however, rendered the complicated rules and case law obsolete, leading to the State Street decision.

The invention in State Street involved financial calculations used in software for a mutual fund.³ In granting summary judgment, the U.S. district court in Boston followed the prevailing view that mathematical algorithms are abstract ideas, and thus unpatentable, unless the claimed invention has "practical application"--interpreted to mean that some device or physical component had to be involved.⁴ In examining the claims, the court found that mere transformation of dollars to fund values in the program's financial analysis, without a component of physicality, did not fall within the exception to the general rule prohibiting algorithmic inventions.⁵

In reversing the summary judgment, the U.S. Court of Appeals for the Federal Circuit

discarded this cumbersome "mathematical algorithm eligibility" analysis as being not useful to patentability determinations and as having little, if any, applicability to determining the presence of statutory subject matter.⁶ The court also cast aside as "ill-conceived" the judicially created "business methods" exclusion, which for many decades denied patent protection to innovations in financial and business programs. The Supreme Court recently denied certiorari, allowing the Federal Circuit ruling to stand.⁷

Implications of 'State Street'

Although the software in *State Street* was directed to financial calculations, the broad language of the holding should encompass all software inventions, at last providing judicial approval of the patentability of software and algorithmic inventions. Now, all inventions are subject to the same patentability requirements: They must be "novel or new," and nonobvious extensions of prior works, and their descriptions must satisfy various disclosure requirements, such as enablement and best mode.

In the wake of *State Street*, almost all companies, particularly Internet and e-commerce firms, have begun to evaluate their technology in light of the benefits of seeking patent protection for their inventive endeavors. Businesses now realize that existing modes of software protection, such as copyright and trade secret, although providing some protection, do not grant the broad scope of coverage, or the royalties, of a patent. With the obstacles removed, software-based companies finally can consider patents as primary weapons in their arsenals.

In 1998, a record 250,000 patent applications were filed with the PTO, and more than 1,600 patent suits were filed with the federal courts. Many technical groups in the PTO, including the data processing and computer group, issued up to 40% more patents than in 1997. Internet patents exploded, from a mere nine in 1991 to about 1,600 in 1998. This trend should accelerate in 1999, as companies begin to exploit this new opportunity fully. With this growth, however, come growing pains.

The PTO tried to accommodate this deluge by hiring hundreds of new examiners. Many now have computer science degrees, something not allowed before 1995. Given the short supply of skilled personnel in this and related computer fields, however, the PTO has suffered and expects a high attrition rate in its computer and software branches, resulting in more applications' being reviewed by inexperienced examiners. This has contributed to the issuance of software patents that have caused uproar, even outrage, in the computer industry.

In 1993, the PTO issued the Compton's New Media patent,⁸ perceived by many as improperly covering the entire multimedia industry and as being directed to technologies that were widely known and used before the patent's filing date. After Compton's began to assert its patent against multimedia developers, the outcry grew so loud that Patent Commissioner Bruce Lehman ordered an unprecedented PTO re-examination of the patent, resulting in significant limitations on the patent's claims.

Problems probing prior art

Despite the influx of new examiners, software patents likely will remain problematic until the technology matures and a repertoire of filings accrues. Because software inventions were denied patent protection for so long and so few patents have issued thus far, patent examiners often cannot review previous archived patents in the software arts to assess whether an invention satisfies the requirements of a patent.

Until recently, the PTO had difficulty accessing written materials, such as software manuals and journal articles, that could bear on the patentability criteria of novelty and

nonobviousness. One difficulty is that, although inventors and their lawyers must report to the PTO examiner all pertinent references of which they are aware,⁹ they have no obligation to research the prior art. Thus, inadequate searching and review by an examiner could lead to a patent, like the Compton's New Media patent, having claims covering existing technology that predates the filing or priority date of the patent application.

The problem of searching prior art has been ameliorated somewhat by the Internet and online databases dedicated to the software arts, but the potential for a poor search and analysis by the PTO will certainly cause doubt in software cases for some time. This doubt may be exacerbated by an unofficial PTO policy of increased allowance of patent applications on the first office action or correspondence to an applicant--an internal incentive for examiners to issue cases faster.

The chance of little-to-no substantive review and prior art checking by examiners and applicants means that an expensive patent could be invalidated, or a lawsuit compromised, if the challenger or defendant can find a single pertinent prior art reference or public disclosure of the invention sufficiently predating the patent filing. A defendant or any third party could also institute a re-examination by the PTO with just one pertinent prior art reference demonstrating that the claimed invention was not novel or was obvious. After a company has invested substantial sums procuring patent rights domestically and abroad, plus production costs, such a scenario could spell serious financial setback, or even ruin.

Similarly, a company may expend great sums commercializing a product without assessing the potential infringement of other patents. It would be well-advised, although not required, to undertake at least a rudimentary patent search before manufacturing and selling an innovation. If a company is sued later for infringement, the issue of whether it sought legal advice is relevant to determining willfulness, which could expose the infringer to treble damages.¹⁰

Importance of investigation

Companies, therefore, should investigate before asserting patents that may be part of dormant portfolios or that may have been acquired in mergers or takeovers, to ascertain their strengths and weaknesses. If sued for infringement, companies should instigate patent searches in the PTO records and database; literature searches for various nonpatent, technical references in online databases, such as Dialog; or hand searches of technical libraries. The Software Patent Institute provides a service and extensive database of journals and articles for the software industry dating back several decades. Although companies may search the prior art themselves, a patent attorney should be consulted to ascertain the scope of patent claims and, if need be, to render an opinion.

Knowledgeable experts in the field also may aid in the investigation and help bolster a case at trial. For example, In Quantel Ltd. v. Adobe Systems Inc.,¹¹ a case involving computer graphics technology, the defendant reconstructed a relic computer imaging system from old equipment in an attempt to demonstrate that the subject patent was invalid in view of the work of another before the patent filing date.

In view of the sharp increase in software patent filings, the clear advice is to file early and often. To preserve foreign filing rights, it is crucial that a patent application, either provisional or utility,¹² be filed before any public disclosure. Web posting, offer to sell or sale of the innovation. Limited beta testing, with executed nondisclosure agreements, should not constitute disclosure. Many inventors and companies consider patenting their technology relatively late in the development process, frequently on the verge of disclosure or sale, triggering crises.

If foreign rights are not a concern, U.S. patent law gives an inventor a one-year grace

period from the sale or disclosure date to file the application. Failure to file a patent application in a timely manner, however, constitutes a dedication of that technology to the world, including competitors.

Nonetheless, because patents are most costly to obtain, particularly if foreign filings are involved, an initial cost-benefit analysis is in order to assess whether an innovation's potential warrants the expense. For example, in the rapidly evolving software arena, some inventions become outdated rather quickly and fail to retain value over the 20-year life of a patent.

Recommended steps

In light of these considerations, a few points should be kept in mind:

- Before commercializing an innovation, conduct a patent search to determine rights.
- Investigate patents that have been acquired or are being asserted, to ascertain their scope.
- Contact a patent attorney well before a critical date in order to ensure the preparation of a complete application covering all facets of the software invention.
- Disclosure before filing destroys foreign patent rights and starts a one-year grace period for a U.S. filing, so consider a provisional patent application if time is too short for a full utility application.
- Consult a patent attorney who has specific expertise in software.
- File early and often.

Patent counsel have a growing array of claim models and perspectives to best cover an invention. In addition to the mainstays of methods, apparatus and system claims, various new claim formats have been introduced, including a memory or data structure containing the inventive program;¹³ a disk, CD-ROM or other media containing the program;¹⁴ and various interfaces and propagated signals. Using these and other formats, claims may be directed to all aspects of software, including business methods or models, multimedia, communications protocols, encryption, data compression, graphics, e-commerce, databases, intelligent agents, computational chemistry, gene sequencing and myriad other existing and potential applications.

The body of software law is growing exponentially. Patents now are considered primary tools for protecting software innovations. Whether an invention is the first of a novice entrepreneur or part of the extensive portfolio of a multinational company, the importance of expertise in software technology cannot be overstated. Keeping a close eye on litigation also is critical, as it further defines the contours of software patent law.

Footnotes

(1) *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), cert. denied, 119 S. Ct. 851 (1999).

(2) *Gottschalk v. Benson*, 409 U.S. 63 (1972). This was the first of a trilogy of Supreme Court cases involving the patentability of algorithms. See also *Parker v. Flook*, 437 U.S. 584 (1978), and *Diamond v. Diehr*, 450 U.S. 175 (1981) (process for curing rubber using mathematical formula on computer found eligible).

(3) See William T. Ellis and Aaron C. Chatterjee, "State Street Sets Seismic Precedent,"

NLJ, Sept. 19, 1998, at B13 and B18.

(4) State Street Bank & Trust Co. v. Signature Financial Group Inc., 927 F. Supp. 502 (D. Mass. 1996), rev'd, 149 F.3d 1368 (Fed. Cir. 1998), cert. denied, 119 S. Ct. 851 (1999).

(5) In particular, the district court applied the Freeman-Walter-Abele test for determining whether a claimed invention is an unpatentable abstract idea or subject to patent protection. In re Freeman, 573 F.2d 1237 (CCPA 1978); In re Walter, 618 F.2d 758 (CCPA 1980); and In re Abele, 684 F.2d 902 (CCPA 1982).

(6) State Street, 149 F.3d at 1374. The court went on to say that "the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.' " Id. (citing In re Alappat, 33 F.3d 1526, 1544 (Fed. Cir. 1994, en banc)).

(7) 119 S. Ct. 851 (1999).

(8) U.S. Pat. No. 5,241,671.

(9) Failure to do so may constitute inequitable conduct or fraud before the PTO, potentially invalidating the patent.

(10) Avia Group International Inc. v. L.A. Gear Calif. Inc., 853 F.2d 1557 (Fed. Cir. 1988). In infringement cases, courts may award up to three times compensatory damages to a patentee if willful infringement is demonstrated.

(11) Civ. A. No. 96-18-RRM, 1997 U.S. Dist. Lexis 16779 (D. Del. Sept. 22, 1997).

(12) An inexpensive provisional patent application may preserve a filing date for the subject matter disclosed in the filed materials. The provisional, however, must be converted to a full utility patent application and filed within one year.

(13) In re Lowry, 32 F.3d 1579 (Fed. Cir. 1994).

(14) In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995).

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