COMMENTS

Hiding Behind Borders in a Borderless World: Extraterritoriality Doctrine and the Inadequacy of U.S. Software Patent Protections in a Networked Economy

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I. INTRODUCTION

On its face, and to an individual not steeped in the often obscure lore of the patent bar, the recent *Microsoft v. AT & T* clash of technology titans seems deceptively simple.[1] To a casual observer, Microsoft confessed to the unauthorized distribution of one of AT & T's patented

inventions to hundreds of thousands of purchasers of the Windows personal computer operating system (Windows) around the globe.[2] Microsoft admitted the validity of AT & T's patent, admitted to infringing the patent by including the invention in Windows, and agreed that it ought to pay some amount of damages to AT & T.[3]

     However, Microsoft employed a unique legal defense and claimed it was not liable to AT & T for infringing sales of Windows to foreign customers because U.S. patent laws do not apply outside U.S. borders.[4] Without the protections of U.S. patent laws, and without patents obtained by AT & T in foreign jurisdictions for the same invention, Microsoft is free to make and sell as many copies of AT & T's invention abroad as it likes, so long as Microsoft does not actually manufacture the individual copies of the software inside the United States.[5] This result may appear unfair, and not simply because the accused is big bad Microsoft, owner of a ninety-two percent share of the world's operating system market.[6] To AT & T's seeming rescue came 35 U.S.C § 271(f), a little-known federal statute with its roots in, of all things, punishing rogue manufacturers of patented shrimp deveining and processing machines. Section 271(f) of the Patent Act outlaws the devious method of skirting the letter of U.S. patent law via the practice of sending individual components of an invention abroad with the intent to assemble the parts into the completed invention outside U.S. borders.[7] Prior to the passage of § 271(f), a person or entity could avoid patent infringement liability simply by purposefully shipping an almost completed invention abroad for final assembly and sale in a foreign country. Since the assembly of the invention was not technically completed in the United States, an infringer could not be said

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     2.   The invention consists of a speech codec, or a method for compressing human speech into digital format for storage and transmission via computer. AT & T Corp. v. Microsoft, 414 F.3d 1366, 1368 n.1 (Fed. Cir. 2005), *rev'd,* 127 S. Ct. 1746 (2007).
     3.   414 F.3d at 1368.
     4.   Unique enough to merit certiorari to the United States Supreme Court despite an almost identical fact pattern passed over for review a year earlier. *See* discussion of *Eolas* case *infra* Part III.B.
     5.   In other words, Microsoft is free to write, test, maintain, and distribute patent-infringing software code so long as the millions of individual copies of the software it sells abroad are not actually "made" (i.e., copied) first in the United States and then shipped overseas. A single copy transmitted or sent abroad, while potentially worth millions of dollars on the market once effortlessly reproduced on compact discs by Microsoft or one of its foreign partners, only amounts to one copy's worth of harm for the purposes of damages calculations. Of course, the patent holder can obtain an injunction to prevent the infringer from ever sending another copy abroad, but the patent cat is out of the proverbial bag at that point.
     6.   Market Share: Market Share for Browsers, Operating Systems, and Search Engines, Operating System Market Share for September 2007, http://marketshare.hitslink.com/report.aspx?qprid=2 (last visited Oct. 15, 2007).
     7.   35 U.S.C. § 271(f) (2000).

to have literally practiced the invention, and was thus not liable for infringement.[8]   AT & T and others argued that Microsoft's delivery of software code to its foreign partners for installation in personal computers abroad amounted to a violation of § 271(f).[9]   AT & T believed that the source code of the Windows operating system containing AT & T's speech codec was an essential component of a patented invention that Microsoft supplied to its foreign partners, with the intent that the code be combined with, or installed on, a general-purpose computer, thus completing and ultimately practicing the invention abroad.[10]

    This was not Microsoft's first brush with § 271(f), and the stakes were quite high.[11]   While Microsoft's appeal of the United States Court of Appeals for the Federal Circuit's ruling in favor of AT & T was pending with the United States Supreme Court, Alcatel-Lucent was granted the largest patent infringement damages award in U.S. history, winning a $1.5 billion jury award against Microsoft for domestic and foreign infringement of Alcatel's MP3 patent concerning methods for compressing digital audio files.[12]   At least a portion of the Alcatel-Lucent award was pursuant to § 271(f) violations. This landmark suit is likely just the beginning of a huge wave of software-related patent infringement lawsuits, and not just because plaintiffs' lawyers smell blood in the water. A great number of the patents in these lawsuits were granted at a time when the very notion of ubiquitous personal computing via the World Wide Web was in its infancy.[13]   In that era, the very notion of a software-

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    8.   *See* discussion of the *Deepsouth* case *infra* Part II.B.
    9.   Microsoft Corp. v. AT & T Corp., 127 S. Ct. 1746, 1753 (2007).
    10.   There are two kinds of software-related patents: software-related product inventions, and software-related method or process inventions. There is technically no such thing as a "software patent" per se, because software code in and of itself can achieve no useful end until it is installed on a computer. A software-related product invention, therefore is not complete until the software is combined with a computer. A method or process enabled by software running on a computer is patentable. *See* discussion of *State Street Bank* case *infra* Part II.D.
    11.   The complexity, ubiquity, and success of Windows, and Microsoft's relatively passive approach to filing for key patents on features of its operating system early on in the product's history, has exposed Microsoft to myriad patent infringement lawsuits covering a wide variety of its operating system features.
    12.   Saul Hansell, *MP3 Patents in Upheaval After Verdict*, N.Y. TIMES, Feb. 23, 2007, at C1, *available at* http://www.nytimes.com/2007/02/23/technology/23patent.html?ex=1175140800. Interestingly, the judge in the *Alcatel-Lucent* case recently reversed part of his pre-trial rulings, throwing out the jury verdict. *See* Steven Lawson, *Big Win for Microsoft in Alcatel-Lucent Patent Case*, PC WORLD, *available at* http://www.pcworld.com/article/id,135598-c,legalissues/ article.html (last visited Aug. 7, 2007). Alcatel-Lucent plans to appeal, but even if it is successful, the initial damages award will almost certainly be reduced because the jury decided before the issuance of *Microsoft v. AT & T* ruling.
    13.   Roughly, between ten and twenty years ago.

related patent was still quite a new thing, with a very short legacy in case law.[14] A great many of the inventions that formed the foundation of the personal networked computing age will likely be the basis of numerous future legal disputes. This is not unexpected in an era of unprecedented technological expansion.   However, the legal arguments in recent significant patent infringement cases have exposed the inability of current law to adequately address and equitably protect the specific nature of software-related inventions.   Due to the outdated and incomplete language of relevant statutes, lawyers on both sides have resorted to forcing some rather square pegs into some proverbial round holes, which have in turn led to some very creative arguments, and to confusing, inconsistent judgments.[15]

    Assuming that legitimate software-related inventions ought to be protected by patent law in the same manner as any other innovation, does current U.S. law adequately protect the property interests of software patent holders? Does the current state of the law sufficiently address the unique nature of software-related inventions such that they receive no less (and no more) protection than other types of patented inventions? This Comment seeks to describe the inability of current U.S. patent law to fully and equitably protect software-related patents in a globally networked economy, and will make recommendations for changes to federal patent statutes to fill gaps in the current system of patent infringement enforcement. This Comment will focus on the challenges likely to be faced by software product and process patent holders through the lens of several recent high profile patent infringement cases and will attempt to demonstrate that an overly strict adherence to the extraterritoriality doctrine undermines the legitimacy and value of many types of software-related inventions that take advantage of the benefits of distributed computer networks. Part II will outline the history of relevant case law and the evolution of federal patent statutes directed at redressing extraterritorial infringement. Part III will discuss in detail several recent patent infringement cases that implicate the extraterritorial application of U.S. patent law. Part IV will attempt to provide several possible statutory solutions to the problems outlined in the previous sections, as well as supply equitable and policy-based reasons for implementing such solutions. Finally, this Comment will argue that in order to adequately

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    14.   *See* discussion of 1981 *Diehr* case confirming the patentability of computer-programmed inventions *infra* Part II.D.
    15.   It is so frequently asserted that the law cannot keep pace with advances in technology that to do so again here amounts to piling on. *See* discussion of Judge Rader's reversal in the *AT & T* case *infra* Part III.C.

address the enforcement problems posed by networked architectures and virtual environments, the patent system may need to employ a legislative patent enforcement framework modeled after the extraterritorial concepts embodied in forward-thinking federal legislation written to match the sophistication of the business strategies employed by supranational corporations: namely, the Sherman Act and the Racketeer Influenced Corrupt Organizations Act.[16]

One of the premises of this Comment—that software inventions ought to be patented at all—is an enormous assumption that must be acknowledged here. Vociferous opposition to the grant of software patents as sound economic and legal policy runs deep both in the United States and abroad, and includes many of the most successful software companies, entrepreneurs, and thinkers. The man credited with inventing the World Wide Web, Tim Berners-Lee, opposes software patents that relate in any way to the software standards used to form and regulate the infrastructure of the Internet.[17] The merits and faults of software patents, in fact the very notion of such a thing as a "software patent," are treatise-worthy topics outside the scope of this Comment.[18] For the purposes of this Comment, it will be assumed that there is such a thing as a legitimately granted software-related patent capable of withstanding legal challenge. There are likely many inappropriately granted software patents out there, just as there are likely many bad patents in general that have yet to be challenged in court. There is ample discussion of reforms to the current patent grant system and the adequacy of the standards used to determine the worth of an individual software-related patent application.[19] Legitimate debate also exists as to whether software-related patents should be treated equally with other types of patents.[20] Again, that is the topic of another Comment. It shall suffice to mention

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16.   This Comment does not seek to equate patent infringement with the gravity of the offenses described in these statutes. Rather, this Comment simply wishes to underscore the inherent complexity of protecting patent rights in a globalized knowledge-driven economy. Antitrust law has been applied against anticompetitive practices in other patent-heavy industries for decades, most notably in the chemical and pharmaceutical industries. *See infra* note 144 and accompanying text. While antitrust law was applied in those cases *against* companies employing patent portfolios in an anticompetitive manner, the same logic can be applied to protect patent holders who face competition from dominant companies that employ the extraterritoriality defense to gain unfair advantages.

17.   TIM BERNERS-LEE, WEAVING THE WEB: THE ORIGINAL DESIGN AND ULTIMATE DESTINY OF THE WORLD WIDE WEB, BY ITS INVENTOR, ch. 13, 196-98 (1999).

18.   *See, e.g.,* Martin Campbell-Kelly, *Not All Bad: An Historical Perspective on Software Patents*, 11 MICH. TELECOMM. & TECH. L. REV. 191 (2005).

19.   *See generally* A PATENT SYSTEM FOR THE 21ST CENTURY (Stephen Merrill et al. eds., 2005).

20.   *Id.*

that it would be logically inconsistent to treat an entire field of innovation differently from all the rest; one cannot possibly deny that the software revolution has involved significant inventive steps, perhaps some of the most significant inventive steps in human history.[21]

II.   OF SHRIMP DEVEINERS AND COMPUTER PROGRAMMERS

A.   *Patent Law and Extraterritoriality Doctrine*

The United States Constitution grants Congress the power "[to] promote the Progress of . . . [the] useful Arts, by securing for limited Times to . . . Inventors the exclusive [r]ight to their . . . Discoveries."[22] Accordingly, U.S. patent law grants a patent holder "the right to exclude others from making, using, offering for sale, or selling the invention" so long as the patent is in force.[23] A patent is, in essence, the grant of a legal monopoly amounting to almost complete control over the invention.[24] An individual is said to infringe on a patent when he "without authority makes, uses, offers to sell, or sells any patented invention."[25]

U.S. patent law traditionally does not protect a patent holder against infringing activity that occurs outside U.S. borders.[26] In fact, there is a very strong general presumption in U.S. courts against applying U.S. law to any activity occurring outside U.S. borders unless Congress specifically indicates in the statutory language that foreign activity ought to be considered.[27] Despite this strong tradition, there are several areas of

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    21.   However, just as logically, all of that remarkably rapid innovation may have occurred *because* of the lack of a rigid system of patent protection for software-related inventions at that unique moment in history.

    22.   U.S. CONST. art. I, § 8, cl. 8.

    23.   35 U.S.C. § 154(a)(1) (2000). Currently, a term of twenty years exists from the time the patent is filed.

    24.   Zenith Radio Corp. v. Hazeltine Research, Inc., 395 U.S. 100, 135 (1969).

    25.   35 U.S.C. § 271(a). Of course, much legal hay can be made of each of the terms in § 271(a), as we shall see *infra* Part II.B. What does it mean to "make" an invention? At what point in the manufacturing process is an invention considered complete? How exactly does one "make" or "sell" an invention that captures a process comprised of discreet steps? Can "command and control" activities such as the actual design, testing, financing, and marketing of an invention comprise part of the manufacture of the invention?

    26.   Although it *was* amended in 1990 to include cases of infringement occurring in outer space on "a space object or component thereof under the jurisdiction or control of the United States." 35 U.S.C § 105.

    27.   EEOC v. Arabian Am. Oil. Co., 499 U.S. 244, 246, 248 (1991) (underscoring the longstanding presumption against extraterritorial application of U.S. statutes when two preconditions are met: (1) the alleged conduct was committed abroad and (2) the statute that would purport to regulate the conduct does not make any mention of whether it is intended to regulate foreign or domestic conduct), *superseded by statute*, Civil Rights Act of 1991, Pub. L. No. 102-166, 105 Stat. 1071 (1991). If there is no mention of the "where" of the activity, the law is presumed to apply only to domestic acts. The reasons behind this presumption are too

U.S. law where the presumption does not apply, even though the relevant statutes do not specifically instruct courts to consider foreign activity. Namely, in antitrust proceedings (the Sherman Act), securities regulation (the Securities Exchange Act), bankruptcy law, investigations pursuant to the Racketeer Influenced and Corrupt Organizations Act (RICO), and the Lanham Act governing trademarks.[28] Because of the sophisticated nature of the offenses in these areas and for reasons of public policy addressed at reducing the harms to society caused by such offenses, courts have tended to set aside extraterritoriality doctrine in favor of casting a wider jurisdictional net. If the holder of a U.S. patent wishes to protect her invention extraterritorially, the only means of protection she could seek would be to apply for a patent on the same invention in each country in which protection is sought.[29]

B.   *Opening the* Deepsouth *Loophole*

In 1972, the United States Supreme Court decided an odd patent infringement case involving automated shrimp processing machines.[30] The unexpected outcome of the 5-4 decision created a ripple effect on patent law policy that has morphed into a rogue wave crashing across the bow of the software industry more than thirty-five years later. Both parties in the *Deepsouth Packing Co. v. Laitram Corp.* case were Louisiana manufacturers of machines used in industrial shrimp processing.[31] Laitram owned a combination patent on a cutting machine that automatically slit and removed the veins from the shrimp.[32] Deepsouth manufactured a similar machine, for which it possessed its own set of patents.[33] After much litigation, Laitram's patents prevailed,

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numerous to list here, and this is a very rich area of study in international law. The basic premise is comity: it is in our best interest to respect the legal institutions of other nations so that they will in turn respect ours. *See generally* William S. Dodge, *Understanding the Presumption Against Extraterritoriality*, 16 BERKELEY J. INT'L L. 85 (1998).

28.   *See* Dodge, *supra* note 27, at 106-08.

29.   While this may seem daunting to an individual inventor, international patent law harmonization agreements have made this a considerably easier task. The Patent Cooperation Treaty enables an inventor to submit an initial patent application to as many as 137 member countries simultaneously. *See generally* Patent Cooperation Treaty Resources, *available at* http://www.wipo.int/pct/en/index.html (last visited Oct. 15, 2007). However, simply submitting an application does not guarantee that the invention will be granted a patent in any of the member countries. The inventor must still prosecute and defend the patent in each country.

30.   Deepsouth Packing Co. v. Laitram Corp., 406 U.S. 518, 530 (1972), *superseded by statute*, Patent Law Amendments Act of 1984, Pub. L. No. 98-622, 98 Stat. 2283 (1984).

31.   *Id.* at 519-20.

32.   *Id.*

33.   *Id.* at 519.

and Deepsouth was enjoined from selling its machines in the United States.[34] However, the case did not end there.

Deepsouth had many customers in foreign countries, and in order to continue supplying machines abroad, it came up with a novel strategy that it did not attempt to hide.[35] Deepsouth continued to manufacture and assemble all of the separate components of the finished machines, packed the components into separate crates, shipped them overseas, and provided its foreign customers with instructions on how to assemble the finished product.[36] Deepsouth argued that it was legally allowed to continue to manufacture each of the separate components of the invention, which were themselves not patented.[37] Deepsouth argued that since it did not technically "make" or "use" the entire invention in the United States, it could not be said to infringe Laitram's combination patent.[38] Surprisingly, the Court agreed with Deepsouth and held that "a combination patent protects only against the operable assembly of the whole and not the manufacture of its parts."[39] Even though Deepsouth sold and advertised the components as a finished machine, what it technically delivered to its foreign customers was not the final "operable" assembly that comprised the patented invention.[40] According to the Court, "'[n]o wrong is done the patentee until the combination is formed.'"[41] The Court stated that absent "a clear and certain signal from Congress," U.S. patent laws were not meant to apply to Deepsouth's foreign activities.[42] Further, it stated:

> [W]e note that what is at stake here is the right of American companies to compete with an American patent holder in foreign markets. Our patent system makes no claim to extraterritorial effect; "these acts of Congress do not, and were not intended to, operate beyond the limits of the United States," and we correspondingly reject the claims of others to such control over our markets. To the degree that the inventor needs protection in markets other than those of this country, the wording of 35 U.S.C. §§ 154 and 271 reveals a congressional intent to have him seek it abroad through patents secured in countries where his goods are being used. Respondent

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34.   *Id.* at 523.
35.   *Id.* at 524 n.5. Deepsouth openly declared to its customers that its business strategy was intended to get around U.S. patent laws.
36.   That the final assembly of the contents of three crates, weighing more than one and a half tons, took less than an hour did not appear to overly concern the Court.
37.   *Deepsouth*, 406 U.S. at 524.
38.   *Id.*
39.   *Id.* at 528.
40.   *Id.* at 527-28.
41.   *Id.* at 529 (quoting Radio Corp. of Am. v. Andrea, 79 F.2d 626, 628 (2d. Cir. 1935)).
42.   *Id.* at 531.

holds foreign patents; it does not adequately explain why it does not avail itself of them.[43]

In a strongly worded dissent, Justice Blackmun decried the "iniquitous and evasive nature of Deepsouth's operations," underscoring the logical difficulty of concluding that Deepsouth did not actually make the machines in the United States.[44] According to Justice Blackmun, the decision allowed an obvious infringer to take advantage of the benefits of the American economy without being "subject to the responsibilities of the American patent laws."[45] Blackmun felt that such a result ultimately undermined the Constitutional mandate of promoting the "progress of Science and the useful Arts" because it permitted free riders to set up shop virtually next door to legitimate patent rights holders in order to steal foreign markets from them.[46]

C.   A "Clear and Certain Signal": The Passage of 35 U.S.C. § 271(f)

Twelve years later, Congress signaled loudly its intent to punish the kind of patent chicanery practiced by Deepsouth in passing The Patent Law Amendments Act of 1984.[47] In part, the law states that one who supplies from the United States most or all of the components of a patented invention with the intent that the components be combined abroad is guilty of patent infringement.[48] The law does not require the parts to actually be assembled abroad; rather the focus is on the activity that occurs in the United States—the actual supplying of the components with the intent to infringe abroad. The law also prohibits supplying individual components from the United States that have no other suitable use than to be combined into a patented invention.[49] The statute can be

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43.   *Id.* (citations omitted).

44.   *Id.* at 533 (Blackmun, J., dissenting).

45.   *Id.* at 534.

46.   *Id.* (quoting U.S. CONST. art. I, § 8, cl. 8).

47.   Patent Law Amendments Act of 1984, Pub. L. No. 98-622, 98 Stat. 3833 (1984) (codified as amended at various sections of Title 35 of the United States Code).

48.   35 U.S.C. § 271(f)(1) (2000). Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer. *Id.*

49.   *Id.* § 271(f)(2). Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will

read as Congress's intent to extend the reach of patent law beyond the U.S. borders.[50]   When viewed more conservatively, the intent is more accurately an attempt to curb duplicitous behavior initiated or carried out on U.S. soil.   In other words, § 271(f) was not necessarily an overt attempt to usurp foreign sovereign legal jurisdiction.

    If anything obvious can be said about the legislative history of the provision, it is that its drafters clearly did not have computer software inventions in mind. The plain language of the statute is heavily oriented toward "nuts and bolts" inventions—mechanical apparatuses with physical moving parts. Even as a legislative tool addressing *Deepsouth* fact patterns, the language is somewhat clumsy and ambiguous, and, as many critics have pointed out, the statute creates a "perverse incentive" to transfer manufacturing facilities outside the United States to avoid § 271(f) liability.[51] Significantly, the focus in the statute on the U.S. locus of manufacture of the components, the "supplying from" language, is a virtual invitation to an infringer like Deepsouth to transfer its component manufacturing facilities abroad where, in addition, production costs are likely to be much lower anyway due to differences in labor and regulatory costs.[52]   How a U.S. patent holder's interest in capturing foreign markets for its invention is any less injured in such a scenario is difficult to discern.   Not only does the competitor now have the competitive advantage of cheaper production costs, his product is manufactured closer to the market in which it will be sold. Nor does the statute address situations where an infringer sends a single copy of an easily reproduced component or a nonfunctioning machine prototype abroad for reproduction in a foreign factory.   There are many more strategies that can be deployed to achieve the same kind of nefarious ends sought by Deepsouth that are not embodied in the statute. In the case of software-related patent holders, these omissions are even more problematic.

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be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer. *Id.*

    50.   Alan M. Fisch & Brent H. Allen, *The Application of Domestic Patent Law to Exported Software: 35 U.S.C. 271(f)*, 25 U. PA. J. INT'L ECON. L. 557, 567 (2004).

    51.   James R. Farrand, *Territoriality and Incentives Under the Patent Laws: Overreaching Harms U.S. Economic and Technological Interests*, 88 J. PAT. & TRADEMARK OFF. SOC'Y 761, 761 (2006).

    52.   *See* Harold C. Wegner, *Microsoft Extraterritoriality: "Mutiny . . . Heresy,"* 25 BIOTECH L. REP. 659, 659 (2006).   By the time the law was passed, the loophole in the manufacturing industry had already closed itself from a practical economic standpoint, because in the intervening twelve years, the economics of the manufacture of machine components necessitated shifting production to foreign factories.   Even U.S. patent holders had begun producing their inventions abroad for importation into U.S. markets. *Id.*

D.   *Something New Under the Sun: The Confirmation of Software-Related Patents*

Until the *Diamond v. Diehr* decision in 1981, it was the official policy of the United States Patent and Trademark Office (USPTO) to reject patents that involved the use of computer software containing mathematical algorithms to achieve the claims of an invention.[53]   This was so because it was generally believed that computer programs were merely expressions of combinations of universally available (and thus, obvious) mathematical algorithms.[54]   It was thought that to grant a limited monopoly on a mathematical algorithm would be akin to giving someone the right to exclude others from calculating 2+2=4 on a chalkboard.   But computer programming is much more than just linking simple algorithms together or harnessing immanent laws of nature.[55]   A computer programmer needs to massage the code he or she writes to consistently and reliably achieve a given task on a computer, with all of the technical constraints that implies.   The code alone accomplishes nothing and, taken by itself, is not patentable subject matter.[56]   In fact, there is, in a literal and technical sense, no such thing as a pure "software patent."[57]   For simplicity's sake, this Comment will use the term "software patent" to refer to any invention that employs a computer program to achieve a beneficial result.   What the *Diehr* decision allowed was the patenting of a rubber-molding process that made use of a computer program to achieve a tangible result.[58]   The focus was on the

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53.   Diamond v. Diehr, 450 U.S. 175, 185-87 (1981).

54.   *Id.* at 186.

55.   To illustrate: Imagine you have a school full of children, and you are tasked with coming up with the fastest and most accurate way of counting them. You can achieve this by hand by walking from room to room and counting out loud, adding together the totals from each room. You could also ask one person in each room to count for you, and to report back the totals. There are an infinite number of ways for you to count the students, including pulling the fire alarm and counting them as they run out the front door. However, what is not obvious to someone trying to solve this simple problem is the fastest and most efficient way to consistently get an accurate count of all the students. A patent on the fastest and most efficient counting scheme does not exclude anyone else from using the underlying mathematical algorithms—the fundamental calculations required in the process of counting—it simply rewards the most ingenious solution.

56.   Software code, rather, is protected by copyright law.

57.   It is perhaps more accurate to refer to them as "computer-implemented inventions"—the term used by the European Patent Convention—or "software-related patents." *See* European Patent Convention: Computer-Implemented Inventions (CII), http://www.epo.org/focus/issues/computer-implemented-inventions.html (last visited Oct. 15, 2007).

58.   *Diehr*, 450 U.S. at 192-93. Software was only one part of the overall invention. The patent had been denied by the USPTO *because* it made use of a very simple computer program that constantly measured the temperature of rubber in a mold in order to determine when the

computer program as part of a "novel and useful structure" employed to solve a technical problem.[59] Generally, as long as the process produces a useful, concrete, tangible result, there is no reason to preclude the grant of a patent simply because the result is produced by a computer.[60] A computer is simply a specially tasked machine enabled by computer code instructions (software) to achieve a result. Software patent claims often describe a system (a group of computers and/or electronic devices) or a product (a single computer) used to achieve a result (the "system" or "product" claims, also described as an "apparatus" claim). However, software patent claims can also be worded to describe a method or process of achieving a result (a "process" or "method" claim). Because most software-related inventions can be conceptualized as both a method and a system, most software patent applications include both types of claims. Thus, software patents have a dual nature, but both forms of claim typically describe the same invention.

     Until the advent of software patents, process patents typically involved the production of some type of physical substance—for example, a chemical compound or a drug.[61] Congress strengthened protections for process patent holders in 1988 when it passed the Process Patent Amendments Act, which outlawed the importation and domestic use of products created by patented methods.[62]

     The last significant development in this area came with the *State Street Bank & Trust Co. v. Signature Financial Group* decision in 1998.[63] *State Street Bank* confirmed the patentability of so-called "business method" patents and reinforced the patentability of software-related

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curing process was complete. Since the algorithm the computer used to calculate the optimum curing time was universally known, it had been deemed not patentable. *Id.* at 180-81.

     59.   *Id.* at 188 (quoting Mackay Radio & Tel. Co. v. Radio Corp. of Am., 306 U.S. 86, 94 (1939)).

     60.   *Id.*

     61.   Process patents have a long history, but were finally codified in the 1952 Patent Act. *See Diehr*, 450 U.S. at 182.

     62.   Process Patent Protection Act, Pub. L. No. 100-418, 102 Stat. 1107 (1988) (codified at 35 U.S.C. § 271(g) (2000)). Whoever without authority imports into the United States or offers to sell, sells, or uses within the United States a product which is made by a process patented in the United States shall be liable as an infringer, if the importation, offer to sell, sale, or use of the product occurs during the term of such process patent. In an action for infringement of a process patent, no remedy may be granted for infringement on account of the noncommercial use or retail sale of a product unless there is no adequate remedy under this title for infringement on account of the importation or other use, offer to sell, or sale of that product. A product which is made by a patented process will, for purposes of this title, not be considered to be so made after—(1) it is materially changed by subsequent processes or (2) it becomes a trivial and nonessential component of another product. *Id.*

     63.   State St. Bank & Trust Co. v. Signature Fin. Group, 149 F.3d 1368, 1370 (Fed. Cir. 1998).

inventions where the object of the invention is the manipulation of information.[64] Extending the holding in *Diehr*, the Federal Circuit held that the "transformation of data . . . by a machine" (a computer programmed with specialized software) is patentable because it comprises a "practical application of . . . mathematical . . . formula[s]" in order to produce a "useful, concrete, and tangible result."[65] The court finally put to rest the notion of a "business method" exception to patentability.[66] What the cases in this line of precedent sought to achieve was not to effect an expansion of the field of patentable inventions, but rather to impose a rational, consistent means of evaluating all inventions. In other words, the goal was to evaluate all patent applications using the same standards, regardless of subject matter. What these cases *do not* mean is that *all* means of doing business and *all* computer programs will now automatically receive patents. Inventions must still be novel, useful, and nonobvious to "a person having ordinary skill in the art."[67] In part, because the standards and specific language courts used to evaluate patent claims were still evolving, it is no surprise that many of the governing statutes, including but not limited to § 271(f), were not able to keep pace with technology and have slowly become conceptually outdated or legally incomplete.

III.   WHEN IS A PART NOT A PART? CONSTRUING § 271(F)

A.   *"Supplying" "Components" Abroad*

Section 271(f) was invoked sparingly after its passage, if only because, as previously mentioned, many major U.S. manufacturing operations moved offshore in search of cheaper labor markets. It no longer made economic sense for an industrial manufacturing company like Deepsouth to manufacture its machines in the United States for export abroad when foreign countries comprised its entire addressable market. However, while the specific factual circumstances of the *Deepsouth* case would indicate that § 271(f) was meant only to apply to the physical component parts of mechanical devices, courts do not hesitate to apply it in other circumstances. The language in § 271(f)

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64.   *Id.* at 1372-73. "So-called" because the grouping of patents under this moniker is somewhat misleading, in much the same way the term "software patent" is misleading.

65.   *Id.* (quoting *In re* Alappat, 33 F.3d 1526, 1557 (Fed. Cir. 1994)).

66.   *Id.* at 1375 n.10 (referring to Judge Newman's description of the business method exception as "an unwarranted encumbrance" that should be discarded as "error-prone, redundant and obsolete" (quoting *In re* Schrader, 22 F.3d 290, 298 (Fed. Cir. 1994) (Newman, J., dissenting))).

67.   35 U.S.C. §§ 102-103 (2000).

clearly refers to all "patented invention[s]" without any limiting language as to scope of the statute.[68]

   However, when patentees attempted to apply § 271(f) to method or process patents, some logical inconsistencies of the statute were revealed. Again, because the category of method patents prior to *State Street Bank* was generally thought to apply only to chemical or industrial processes that resulted in the creation of a physical end product or compound, it is clear that the drafters of § 271(f) did not explicitly incorporate the metaphor of steps in a process. Most recently, the Federal Circuit held that the export of a catalyst used in a patented chemical process that did not necessarily become part of the end product could be construed to fulfill the § 271(f) "supply of a component" requirement.[69]

B.   Eolas v. Microsoft*: Supplying Software Product Components Abroad*

   The first significant application of § 271(f) to a software-related product patent to reach the Federal Circuit occurred in 2005, when tiny Eolas Technologies (Eolas) wrestled a $521 million jury verdict from Microsoft Corporation.[70] Eolas consists of one person holding exclusive license to a patent developed by the University of California and neither makes nor sells any products. This case could be viewed as a David vs. Goliath story, the ultimate triumph of the lone inventor over the mega-corporation. A less generous view would be to label the man behind Eolas a "patent troll," or one who vigorously enforces dubious patents but does not contribute anything useful to society.[71] Eolas claimed to have invented a Web browser function that enabled the browser application to automatically invoke and connect to external or remote desktop applications, such as a spreadsheet or a streaming video

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   68.   *Id.* § 271(f).
   69.   Union Carbide Chems & Plastics Tech. Corp. v. Shell Oil Co., 425 F.3d 1366, 1379 (Fed. Cir. 2005). This case came after the *Eolas, NTP,* and *AT & T* decisions, *infra* Parts III.B-C, D. Much of the reasoning in those cases was used to support the conclusion that a catalyst used in a step in a chemical process could be considered a component under § 271(f).
   70.   Eolas Techs., Inc. v. Microsoft Corp., 399 F.3d 1325, 1341 (Fed. Cir. 2005). Again, as a result of the *AT & T* decision, the § 271(f) damages portion of the award no longer holds. Microsoft recently settled with Eolas for an undisclosed sum. *See Microsoft Settles a Dispute Over a Feature in Its Browser*, N.Y. TIMES, Aug. 31, 2007, at C4, *available at* http://www.nytimes.com/2007/08/31/technology/31soft.html.
   71.   *See* Wikipedia, *Patent Troll*, http://en.wikipedia.org/wiki/Patent_troll, (as of Oct. 21, 2007, 23:34 GMT). However, one views the case, the age of the intellectual property holding company and the securitization of intellectual property assets is surely upon us. *See* discussion of NTP, an intellectual property holding company, *infra* Part III.D.

application.[72] In the early days of the Internet, typical Web browsers were only able to retrieve and display to the user basic Web pages comprised of text and pictures. Modern Web surfers take today's highly interactive Internet environment for granted. When the patent was issued, the notion of a multi-tiered Internet network architecture permitting complex business applications to function across continents was just a pipe dream. Much of the controversy over the *Eolas* patent may stem from the fact that the case took so long to wend its way through the courts. The patent in question was first applied for in 1994 and finally granted in 1998.[73] Eolas claimed that a similar function in Microsoft's Internet Explorer product infringed its patent and sued under § 271(a) for domestic infringement and under § 271(f) for supplying Internet Explorer to Microsoft's foreign customers.[74] Because the patent claims included both a method and a computer product for invoking software applications via a Web browser, Eolas argued that the Internet Explorer software code was an essential component of the overall invention and that Microsoft had intentionally supplied the code to its foreign partners for installation on general-purpose computers. Microsoft responded that computer code cannot be understood to be a component in the *Deepsouth* sense of an invention because software code is nothing more than intangible information.[75]   Further, Microsoft insisted that it did not supply components for combination abroad in the sense meant by § 271(f).[76] Rather, it sent incomplete, uncompiled software to its foreign partners on a handful of "golden" master disks, none of which were actually combined with or installed on the computers that were then sold to the public.[77] Even if software code could be understood to be a component of an invention, none of the physical components Microsoft sent abroad were actually combined, in a *Deepsouth* mechanical sense, with a general-purpose computer.[78] Microsoft argued that what it sent abroad

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72.   *Eolas*, 399 F.3d at 1328.

73.   *Id.* at 1328 n.1. This dynamic will surely be repeated until the first wave of software- and Internet-related patent litigation exhausts itself.

74.   *Id.* at 1331.

75.   *Id.* at 1340.

76.   *Id.*

77.   *Id.* at 1331. Uncompiled software code requires transformation into binary form in order for a computer to understand it. Uncompiled, or source code, is the code in its human-readable form (what the programmer actually types), and compiled code is the code in its machine-readable, or object form (the ones and zeros encoded on the surface of a hard disk drive that the computer "reads"). *See* Tech Target, What Is Machine Code?, http://searchsmb.tech target.com/sDefinition/0,,sid44_gci212507,00.html (last visited Oct. 15, 2007).

78.   *Eolas*, 399 F.3d at 1331. What was actually installed on the computers were copies of the compiled software code that Microsoft's partners made from the original uncompiled software on the master disk. *Id.* at 1339. Microsoft further argued that nothing they sent was actually

was more akin to a "mold" or a "template" than to an actual component. It also argued that in order for it to have violated § 271(f), it would have had to have created thousands of copies of the component software in the United States first and *then* supplied those copies to its partners.[79]

The court ultimately sided with Eolas, finding that software code on a master disk "is much more than a prototype, mold, or detailed set of instructions."[80] Judge Rader stated the code

> in effect drives the "functional nucleus of the finished computer product," . . . Without this aspect of the patented invention, the invention would not work at all and thus would not even qualify as new and "useful." Thus, the software code . . . is not only a component, it is probably the key part of [the] . . . invention.[81]

Judge Rader went on to cite the 1994 World Trade Organization's Trade-Related Aspects of Intellectual Property Agreement (TRIPS) as added justification for concluding that software code should be treated as a component of a patentable inventions, stating that there was no "principled" argument that could be made that would justify treating software inventions differently from mechanical ones.[82]

C.   *Rader's Reversal:* Microsoft v. AT & T *and Supply Chain Shenanigans*

Less than four months later, Judge Rader experienced a drastic change of heart in interpreting the "supply" element of § 271(f) in his dissenting opinion in *AT & T*.[83] The majority held that Microsoft's

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physically installed on, or mechanically combined with, any completed patented invention because what technically transpired was not a physical process per se. *Id.* at 1339-40. A laser scanned the master disks Microsoft sent, converted the software code into an electronic signal, and then those electronic signals were magnetically encoded onto the computer's hard disk drive. *Id.* at 1332.

    79.   *Id.* at 1332. And one wonders whether Microsoft would accept that even those thousands of copies are ever actually physically combined with a computer, in the molecular sense. Recall that the invention's claims are comprised of a specially purposed computer, not stand-alone software. Technically the invention is a machine, so the invention is not complete until the hard disk drive in the machine is magnetically encoded with the proper instructions. The instructions arrive on the computer via an electronic signal generated by a laser that reads the code from a separate disk.

    80.   *Eolas*, 399 F.3d at 1339.

    81.   *Id.* (citations omitted) (quoting ImagExpo, L.L.C. v. Microsoft Corp., 299 F. Supp. 2d 550, 553 (E.D. Va. 2003)).

    82.   *Eolas*, 399 F.3d at 1339; *see also* WORLD TRADE ORG., THE LEGAL TEXTS: THE RESULTS OF THE URUGUAY ROUND OF MULTILATERAL TRADE NEGOTIATIONS 332 (1999). "[P]atents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced." *Id.*

    83.   AT & T Corp. v. Microsoft Corp., 414 F.3d 1366, 1372 (Fed. Cir. 2005), *rev'd*, 127 S. Ct. 1746 (2007).

delivery of the software on master disks to its foreign partners constituted a violation of § 271(f).[84]   Microsoft supplied a component of a patented invention abroad with the intent of combining the component software with general-purpose computers to practice the invention. In his dissent, Rader retreated to the strict embrace of extraterritoriality doctrine, decrying the potentially "endless liability [for U.S. software companies] . . . for products manufactured entirely abroad."[85]   In this new stance, Rader argued that an infringer should only be liable under § 271(f) for the copies of the software that were manufactured or produced domestically.[86] In other words, § 271(f) damages calculations should take into account strictly the number of copies Microsoft produced in the United States.[87]   Rader posited a discernible legal distinction between making the multiple copies of the software in the United States and electronically transmitting or shipping a single master disk abroad that is then itself copied extraterritorially.[88]   While maintaining that computer code can be considered a component of a patented invention, Rader attempted to carve out an exception to § 271(f) liability for any copies of the software that were created outside the United States.[89] Rader asserted that punishing software makers for the ease with which their products can be replicated sets an unfair legal precedent that discriminates against software inventions generally.[90] The *AT & T* decision drew the attention of the United States Supreme Court, which granted certiorari on two issues: first, the determination of whether software code constitutes a component of a patented invention for the purposes of § 271(f) analysis; and second, whether copies of software code created overseas from a U.S. master disk can be considered to have been "supplied from the United States" under § 271(f).[91]

  In an 7-1 decision, the United States Supreme Court reversed the Federal Circuit and held (1) that software code alone cannot be construed a component of a patented invention for the purposes of § 271(f); (2) that a copy of the software code *can* be construed as a component, and (3) that copies of software code made abroad from a master copy

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  84.   *Id.*
  85.   *Id.*
  86.   *Id.* at 1373.
  87.   *Id.*
  88.   *Id.*
  89.   *Id.*
  90.   *Id.* at 1374 (citing the very same TRIPS provision he used in *Eolas* to argue *in favor* of § 271(f) liability); *see supra* note 82 and accompanying text.
  91.   Microsoft Corp. v. AT & T Corp., 127 S. Ct. 1746, 1753-54 (2007).

supplied from the United States cannot be deemed "supplied" from the United States.[92] In an interesting footnote, the Court stated that it

> need not address whether software in the abstract, or any other intangible, can ever be a component under § 271(f). If an intangible method or process, for instance, qualifies as a "patented invention" under § 271(f) (a question as to which we express no opinion), the combinable components of that invention might be intangible as well.[93]

This footnote has interesting implications for future § 271(f) cases because it opens the door to applying the law to software-related process and method patent infringement cases. The Court also repeatedly stated that there are plausible arguments for extending § 271(f) and construing the law against Microsoft, but that the general principle of not applying patent law extraterritorially counsels against doing so absent a direct mandate from Congress.[94]

It is tempting to point out here that the kind of hair-splitting involved in Rader's dissent and in Microsoft's appeal is the same kind of evasive legal thinking that led to the creation of § 271(f) in the first place. The option of cleaving to the cleanliness of the extraterritoriality doctrine is seductive in its simplicity but flies in the face of the sophisticated realities of Microsoft's business model, marketing materials, and product distribution methods. Today, when one installs a legally purchased copy of the Windows operating system on a personal computer, the software registration process automatically connects the computer via the Internet to a Microsoft application server.[95] Such an installation can even occur over the Internet without the need for a CD-ROM containing a copy of the software. The user is then prompted to install any recent enhancements, new products, or security updates to Windows that were made during the time between the making of the initial copy of the software and the first installation. Of course, this process is marketed to the consumer as "free upgrades" or "critical security patches", but it is essentially a process by which Microsoft ensures that its users possess legally acquired software. In fact, the product purchase is not complete,

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92.   *Id.* at 1760.
93.   *Id.* at 1756 n.13.
94.   *Id.* at 1751.
95.   Microsoft's own use of the term "component" betrays the disingenuousness of its position.   Ironically, one of the core technologies Microsoft developed to allow disparate computer applications to communicate with each other over a network was itself called COM, for Component Object Model (subsequently renamed .NET for marketing purposes).   One can download from an entire library of COM and .NET software components for use in creating interactive web applications from Microsoft at MSDN Download Center, http://msdn2.microsoft.com/en-us/downloads/default.aspx.

and the operating system as a whole will cease to function properly if the purchaser does not complete the click-through licenses in the registration process, and enter the proper registration key. At all times, Microsoft seeks to maintain an intimate and continuous connection with purchasers of its software products. If the computer is turned on, and connected to the Internet, Microsoft has the ability to "push" new products to the user instantaneously. This is a far cry from the practice of packing tons of equipment into crates and providing a simple instruction sheet on how to complete the last step in assembling a shrimp-cleaning machine. In fact, the trend today in the software industry is no longer the sale of prepackaged copies of software burned onto a compact disc for distribution and installation on individual computers. Advances in network technology and the ubiquity of high-speed connections to the Internet have allowed entirely new business models to emerge. The notion of software-as-a-service has challenged old-line software companies to modernize their offerings by enabling users to access, manage, and interact with business applications via the World Wide Web. Pioneering companies like Google, Salesforce.com, Oracle, IBM, and even Microsoft have harnessed the advantages of the Internet network to offer an entire suite of applications and services that require no software downloads, often free-of-charge to the consumer. It is estimated that such services will comprise thirty-four percent of the total software market by 2008, or more than forty-three billion dollars in revenue.[96] The seeds of innovation planted in patents like the very one in the *Eolas* case—which, if recalled, allowed an Internet Web browser to automatically connect to and invoke an offline application on a remote computer—made Rader's concerns for the software industry in his *AT & T* dissent obsolete before he ever sat down to put them to paper.

D.   NTP v. RIM*: What A Tangled Web We've Weaved*

Advances in networked computing occur so quickly that the by the time courts get around to adjudicating the merits of a patented software-related invention, new technologies will have rendered said patent irrelevant or obsolete. The very nature of the art of computer programming lends itself to elegant work-arounds and system redesign. However, that does not mean that we should not strive to protect genuine innovation when it actually occurs. This open-ended principle was

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96.   *See* K.B. Chandrasekhar, *On-Demand Software: From Revolution to Evolution*, SoftwareMag.com, http://softwaremag.com/L.cfm?doc=1204-ThoughtLeadership-k_chandrasekhar (last visited Oct. 15, 2007).

embodied in the *State Street Bank* decision, which confirmed the patentability of nonobvious, novel methods of doing business so long as the method produces a useful result.[97] While federal statutes in this area have been added or modified to protect these innovations, the process is far from complete.[98] One month after the *AT & T* decision, the Federal Circuit tackled a technological perfect storm presenting a cornucopia of novel infringement claims.[99]

      Research In Motion (RIM) is the manufacturer of the Blackberry family of handheld personal communication devices.[100] In addition to enabling cellular telephone service, the Blackberry device enables a user to connect wirelessly to RIM's private computer network in order to retrieve messages that have been automatically forwarded to the RIM network from the user's various e-mail accounts.[101] In this manner, a user is automatically informed of new e-mail messages without needing to repeatedly log in to a computer.[102] Users are thus able to keep track of e-mail messages wherever the Blackberry device can receive a wireless signal over the RIM network.[103]

      NTP holds several patents relevant to the products and services provided by RIM.[104] NTP's patents claim both a system of coordinating the wireless transmission of e-mail messages and a method of enabling a computer network to transform e-mail messages for transmission to wireless devices.[105] NTP sued RIM for infringement of its system and method patents, asserting causes of action under § 271(a), § 271(f), and § 271(g).[106] RIM countered that NTP's patent did not reach RIM's system because the computer server RIM employed to manage its network was located in Canada and thus outside the jurisdictional protection of U.S.

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      97.   *See* discussion of the patentability of business methods and the *State Street Bank* case *supra* Part II.D.
      98.   For example, the Process Patent Protection Act of 1988, codified at 35 U.S.C. § 271(g) (2000), which purports to prevent the importation of the product of a patented process. It reads in part, "[w]hoever without authority imports into the United States or offers to sell, sells, or uses within the United States a product which is made by a process patented in the United States shall be liable as an infringer." *Id.*
      99.   NTP, Inc. v. Research in Motion, Ltd., 418 F.3d 1282 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1157 (2006).
      100.   *Id.* at 1289. Colloquially known as the "Crackberry" due to its information-addictive properties.
      101.   *Id.*
      102.   *Id.* at 1290.
      103.   *Id.* at 1289-90.
      104.   *Id.* at 1289.
      105.   *Id.*
      106.   *Id.* at 1290-91.

patent laws.[107]   RIM made the same assertion in regard to direct infringement of NTP's method patent, claiming that some of the steps in the process described in NTP's patent occurred outside U.S. borders.[108] RIM also denied liability for § 271(f) infringement because its system did not supply any components of a patented invention to another country.[109] Finally, RIM denied that it imported the "product . . . made by a process patented in the United States" as construed in § 271(g).[110] NTP claimed that the specially formatted e-mails forwarded to the Blackberries comprised the product's patented wireless e-mail transmission process.[111]

On NTP's system patent claim, the court held that even though a key component of the system (RIM's e-mail forwarding or "Relay" server) resided outside the United States, the overall use of the system occurred inside the United States.[112] "The use of a claimed system under 271(a) is the place at which the system as a whole is put into service, i.e., the place where control of the system is exercised and beneficial use of the system obtained."[113]

On NTP's method patent claims, the court reached a different, somewhat incongruous conclusion. Because not all of the steps or acts claimed in NTP's method occurred inside U.S. borders due to the Canadian placement of the Relay server, no infringement occurred.[114] The court also denied NTP's § 271(g) claim on the grounds that the transformation of e-mail data produced by RIM's process and delivered to customers in the United States on their Blackberry devices was not a physical product of a patented process as conceived by the statute and thus could not be said to have been "import[ed] into the United States."[115] Although the court recognized that precedent specifically allowed for the patenting of "a[ny] process that applies an equation to a new and useful end," including the production of pure information, it stated that § 271(g)

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107.   *Id.* at 1291. RIM is a Canadian company headquartered near Toronto. *Id.* at 1289.

108.   *Id.* at 1317.

109.   *Id.* at 1321. The Blackberry devices were sold to customers in the United States and were not subsequently re-exported. Nor was the software used to manage the system developed in the United States and shipped abroad. Rather, RIM developed the allegedly infringing software in Canada.

110.   *Id.* at 1323 (quoting 35 U.S.C. § 271(g) (2000)).

111.   *Id.*

112.   *Id.* at 1317.

113.   *Id.* Technically, it is the Blackberry users who directly infringe the patent, whereas RIM is guilty of inducing infringement by providing the service.

114.   *Id.* at 1318.

115.   *Id.*

was only intended to apply to the importation of tangible or physical products that result from patented processes.[116]

The *NTP* case presented for the first time a highly complex, technologically modern patent infringement scenario that transcended national borders. It involved both product and method patents, territorial and extraterritorial infringement, and difficult, and sometimes contradictory statutory construction problems. Why was NTP's system patent treated so differently from its process patent? And why did the court insist that § 271(g) does not apply to intangible products of patented processes, when it had gone to so much trouble to establish the legitimacy of process patents? If we are to treat all patents equally, this reading of § 271(g) clearly protects process patents with tangible results more aggressively than process patents that produce intangible results. It sets up a regime in which "matter" is worthy of more protection, and thus more valuable, than "information." In a knowledge economy, does this hold true? And on what principled grounds do we distinguish between the two?

After the decision, NTP received more than $612 million in a settlement with RIM.[117] If NTP's patent drafters had merely applied for a method patent on its wireless e-mail invention instead of both a system patent and a method patent, RIM would have paid nothing. What is most striking is that the two types of patents are really just two different ways of describing the same thing. That so much money could hinge on the difference should be unsettling to observers.[118] *NTP* may just be the tip

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116.   *Id.* at 1324 (quoting AT & T Corp. v. Excel Commc'ns, Inc., 172 F.3d 1352, 1357 (Fed. Cir. 1999)).

117.   A district court judge had threatened to enjoin RIM from continuing to provide service to its customers if infringement were found, and RIM capitulated rather than suffer its customers' wrath. All this despite new rulings from the USPTO that invalidated most of NTP's patents. News accounts referred to the suit as a high stakes game of poker, with NTP timing its settlement offers in hopes that RIM would bite before the USPTO issued its rulings. *See* Andrew R. Hickey, *RIM Settles with NTP, Spares Blackberry Partners*, SEARCHMOBILECOMPUTING.COM, Mar. 6, 2006, http://searchmobilecomputing.techtarget.com/originalContent/0,289142,sid40_gci1170743,00.html. After success against RIM, NTP recently sued several other wireless e-mail providers on the basis of the same patents. *See* Mike Musgrove, *NTP Back In Court Over Patents*, WASH. POST, Sept. 17, 2007, at D02, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2007/09/16/AR2007091601321.html.

118.   This Comment attempts to make the case that there will be more and more lawsuits like the *NTP* case. Unfortunately, the underlying legal issues were clouded by the popularity of the RIM system and the ubiquity of the Blackberry device. NTP makes no products and does not use, sell, or make any of the inventions it patented. It is an intellectual property holding company formed solely for the purpose of providing an investment vehicle for the licensing of NTP's patents. It is a technology company with more than fifty patents that does not even have a Web site and as such, has become a patent troll poster child in the media. *See supra* Part III.B and note 71 and accompanying text. Critics of the *NTP* decision would be wise to pay attention to the

of the extraterritorial patent infringement iceberg. It is not difficult to play with the facts of the preceding cases to imagine alternative yet realistic outcomes under the same reasoning applied by the Federal Circuit in its analysis of § 271(f).

E.   *Back to Reality? A World Without § 271(f):* Voda v. Cordis

It has been suggested that one possible solution to solving the § 271(f) conundrum would be to have U.S. courts assume supplemental jurisdiction over instances of foreign patent infringement.[119] In this way, the parties would litigate all of the infringement claims in one courtroom, applying foreign patent law when necessary.[120] This device would eliminate many of the § 271(f) statutory interpretation pitfalls that plagued the *Eolas*, *AT&T*, and *NTP* courts.[121] Supplemental jurisdiction over foreign legal claims is not a novel or radical concept, and American courts are frequently called on to apply foreign law in diversity jurisdiction cases where the various claims have been shown to possess a "common nucleus of operative fact."[122] U.S. courts have even shown a willingness to join foreign claims in the intellectual property area, most notably in copyright and trademark cases.[123] However, an analysis of the outcome of another recent Federal Circuit case underscores the hesitance U.S. courts are likely to possess when deciding to assume supplemental

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application of the federal statutes to patent protection rather than focus on the invalidity of the individual patents in dispute in the case. After all, a patent troll is only a troll in hindsight when the patent is ruled invalid. If the patent is legitimate, the patent holder would be a patent fool if he did not protect his rights to the fullest extent of the law.

119.   Paul Margulies, *What's All the Fuss? The "Parade of Horribles" When Applying 35 U.S.C. to Software Patents*, 14 CARDOZO J. INT'L & COMP. L. 481, 506-07 (2006).

120.   For the purposes of this scenario, it is assumed that the U.S. patent holder also holds foreign patents on the same invention, as was the case in *Deepsouth*. Many of the plaintiffs in the cases discussed herein held foreign patents in addition to their U.S. patents. Of course, for U.S. patent holders who have applied for, but have not yet been granted, a foreign patent or who have been refused a foreign patent for whatever reason, this alternative would not be available.

121.   However, some of the interpretation problems are not so easily solved. For instance, there still remain some § 271(a) and § 271(g) issues with regard to method patents. What exactly does it mean to "import" the product of a patented method? Can importation/exportation occur electronically? Recall that the *NTP* court held that where the product of a patented method consists of intangible information, § 271(g) is inapplicable. However, imagine an electronic photo processing service based abroad that applies a method for rendering three-dimensional, 360° images out of ordinary two-dimensional photographs. The process just happens to infringe a U.S. method patent but under the *NTP* holding, does not apply to importing intangible information in the form of electronic photographs resulting from a patented method.

122.   Voda v. Cordis Corp., 476 F.3d 887, 894 (Fed. Cir. 2007) (quoting United Mine Workers of Am. v. Gibbs, 383 U.S. 715, 725 (1966)). This is an oversimplification of the supplemental jurisdiction issue; a rough sketch will need to suffice here. An in-depth discussion is outside the scope of this Comment.

123.   Margulies, *supra* note 119, at 507 n.120.

jurisdiction over patent infringement suits. While the suit is not an application of § 271(f), it is illustrative of the problems that remain for U.S. patent holders when protecting their inventions in foreign markets against American competitors who infringe their patents.

       In the early 1990s, Dr. Jan Voda invented and patented a device used to guide catheters during heart surgeries.[124] Voda also applied for foreign patents on the very same invention, taking advantage of the Patent Cooperation Treaty's (PCT) patent application process.[125] Cordis, an American subsidiary of Johnson & Johnson Co. with divisions throughout Europe and Canada, manufactured a similar device—at first in a plant in the United States and later in Mexico.[126] Voda claimed that the Cordis device infringed his patents and sued in federal court.[127] When Voda attempted to amend his claims to join the instances of infringement of his foreign patents, Cordis appealed, asserting that the district court lacked subject matter jurisdiction over the foreign patent claims.[128]

       Despite the identical nature of the claims in Voda's various patent applications and the fact that a jury had already found for Voda on his U.S. claims, the Federal Circuit reversed the district court's decision allowing joinder.[129] The two-judge majority decided against Voda for several reasons. The panel disputed the similarity of the claims of Voda's patents, even though they had all been submitted via the PCT system and essentially consisted of translations into the native languages of the various countries.[130] The panel disputed the district court's discretion to hear the foreign claims.[131] The court also stated that the principle of sovereign judicial independence of foreign patent systems embodied in international patent treaties did not permit a U.S. court to hear the claims.[132] The court said that joinder would undermine the "spirit of cooperation" embodied in the international comity doctrine.[133] Since the property rights at issue in the patents were created by foreign sovereign powers, it is for those foreign courts to adjudicate any disputes arising from those rights.[134] Finally, the court declared that it would be judicially

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       124.   *Voda*, 476 F.3d at 890.
       125.   *Id.* Voda eventually received patents on the invention in France, Britain, Germany, and Canada. *See supra* note 29 and accompanying text.
       126.   *Voda*, 476 F.3d at 891.
       127.   *Id.* at 890-91.
       128.   *Id.* at 891.
       129.   *Id.*
       130.   *Id.* at 910-11 (Newman, J., dissenting).
       131.   *Voda*, 476 F.3d at 900.
       132.   *Id.*
       133.   *Id.* at 902.
       134.   *Id.*

inefficient to attempt to adjudicate a dispute as complex as one involving multiple patent regimes and ultimately unfair to a defendant since a U.S. court has no ultimate authority to assert or deny the validity of a foreign-issued patent.[135] If a U.S. court found infringement of a foreign patent, but a foreign court later declared the patent to be invalid, the defendant would be faced with the cost of having to defend himself in a U.S. court unnecessarily. In support of the inefficiency-due-to-complexity assertion, the court pointed to the rationale behind the creation of the Federal Circuit to exclusively hear patent suit appeals and stated that foreign jurisdictions had also created their own specialized courts to handle the complexity of patent cases.[136]

      In dissent, Judge Pauline Newman described a litany of cases in which U.S. courts routinely applied foreign law across a wide variety of complex subject matters, including patent infringement.[137]   Judge Newman reminded the majority that the *Voda* suit involved two American parties and that other countries have not balked at applying American law in deciding patent disputes.[138] Newman called the majority panel decision an "extreme limitation" on the district court's discretion to hear foreign claims.[139]

      Where does the *Voda* decision leave an inventor who holds both U.S. and foreign patents? For now, the inventor must file suit in each separate jurisdiction. For a multinational corporation with deep legal resources and experience prosecuting and defending patent claims, this burden is certainly far less daunting than for an individual inventor like Dr. Voda. And what of software-related inventions? If the Federal Circuit felt that the nature of Voda's relatively straightforward foreign claims were too complicated to allow a U.S. court to hear them, it is unlikely that they would look any more favorably on the ability of a U.S. court to parse software product and method patent claims—particularly when there remains genuine disagreement in other jurisdictions over the nature and extent of the patentability of software-based inventions. Despite decades of attempts to harmonize patent laws at the international level, none of the various agreements provide for "full faith and credit" regarding the decisions arrived at by foreign courts in patent disputes.[140]

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      135.   *Id.* at 904.
      136.   *Id.* at 902.
      137.   *Id.* at 906-17.
      138.   *Id.* at 917.
      139.   *Id.*
      140.   *Id.* at 903.

While a different sort of relief may be available to U.S. inventors in foreign venues, the relative ease and speed at which a software patent can be infringed is contrasted by the great expense and duration of a raft of lawsuits in multiple jurisdictions. The cost of litigating the patent claims in each foreign nation could possibly approach the total market value of the invention, with no guarantee of relief. There is a fundamental unfairness revealed by this dynamic that favors large companies over small businesses, start-ups, and individual inventors. A very large company may choose to deliberately infringe a smaller competitor's patent in hopes that the competitor's resources will be exhausted.[141] Strategic patent infringement can thus be used as a means of limiting the reach of a competitor's addressable market. Whereas Deepsouth had to at least bear the cost of manufacturing and shipping tons of equipment to another country, a software invention can be transmitted around the world in a matter of seconds. Supplemental jurisdiction is a perfectly valid solution, but it is up to the Federal Circuit to be bold enough to take on that responsibility. If *Voda* is any indication, such boldness is not yet in evidence.

IV.   RECOMMENDATIONS AND CONCLUSION

The foremost recommendation to patent policy makers can be found in the conclusion of a recent National Research Council study which stated:

> [To] preserve an open-ended, unitary, [and] flexible patent system . . . the features that allow somewhat different treatment of different technologies should be preserved without formalizing different standards, for example, in statutes that would be exceedingly difficult to draft appropriately, difficult to change if found to be antiquated or inappropriate, and at odds with U.S. international commitments.[142]

While this recommendation is primarily directed at patentability criteria (the methods and standards used to evaluate a patent's validity), it applies equally to the protection of a patent holder's rights. Interpreting § 271(f) as applicable only to mechanical inventions, or to some kinds of inventions but not to others, runs counter to a unitary patent system. This Comment has tried to demonstrate that the special nature of software-related inventions and other computer-implemented inventions that take

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141. The American Intellectual Property Lawyers Association (AIPLA) recently stated that the average cost of litigating a single patent infringement suit is between four and six million dollars. *See* American Intellectual Property Lawyers Association Web Site, http://www.aipla.org/.

142. A PATENT SYSTEM FOR THE 21ST CENTURY, *supra* note 19, at 8.

advantage of the distributed architecture of the Internet are not fully protected by current patent laws. Applying a unitary standard of protection to these types of patents requires an analysis that appreciates the complexity of the underlying technology, and a reevaluation of the strictures of traditional extraterritoriality doctrine in relation to patent enforcement.

Section 271(f) was intended to close a loophole in U.S. patent law, but due to the ongoing expansion of the scope of patentable inventions since the law was enacted, it has served to open others. Rather than repeal the provision, the entire code section needs to be revised. Instead of relegating them to subsections, § 271 should be updated to incorporate the precise nature of software-related inventions to explicitly include software system and software method inventions, not just patented products. The components of software-based systems may be distributed around the globe, and the law should reflect this reality. The statute should take into account patented "software-as-a-service" business models that derive revenue other than from direct sales of copies of software.

Section 271(f) must be also be updated to reflect the realities of software-based inventions. The definition of "component" should explicitly include software code, whether it is produced in one location or manufactured by an internationally distributed team of programmers. The term "supply" must also be expanded to include electronic transmission of software code, the mode in which most software is distributed today. Section 271(f) should also be modified to accommodate software-based business method inventions. A software component that is exported to another country for use in such a method should fall under the statute. Unpatented software components that are deployed domestically to effect a "step" in software method that is largely implemented outside U.S. borders should be brought into § 271(f) analysis.

Finally, § 271(g) should be amended to capture the electronic import or export of the data that results from software-based business methods. The data is the beneficial result of a patented process, and is, as such, the very source of value of the patent. Intangible business method patents must receive at least the same protection as chemical or industrial processes.

That the drafters of § 271(f) did not foresee the advent of the Information Age is an unfortunate historical accident.[143]   However, despite the limited language of the statute, at its heart the law sought to prevent the kind of overt manipulation of the patent laws as practiced by Deepsouth. Similarly, Microsoft admitted to violating AT & T's patent, both in the United States and abroad. Should Microsoft have been allowed to benefit from blatant infringement abroad that was planned, initiated, and completed from within U.S. borders? When confronted with harmful, highly sophisticated, supranational, and anti-competitive business activities, Congress responded with the Sherman Act.[144]   In order to combat international organized crime syndicates, Congress enacted the Racketeer Influenced Corrupt Organizations Act.[145] International patent infringement may not be the moral equivalent of Al Capone in the public eye, but the sums of money and the complexity of the technologies involved merit a system of legal protection that does not permit infringers to hide behind national borders.   Absent an international agreement that provides for "full faith and credit" for the rights of U.S. patent holders, Congress should move to prevent companies doing business in the United States from manipulating U.S. patent laws to their advantage. One of the stated goals of international efforts to harmonize the global intellectual property system is "to promote effective and adequate protection of . . . rights." It would be a tragedy if the principle of comity were enlisted in the cause of maintaining a balkanized patent system where the knowledge assets of only very rich corporations are protected.

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    143.   It was not the first time a reactionary, myopic law was passed to punish past behavior. Legislators can often only see through rear-view mirrors.
    144.   *See* Sherman Act, codified at 15 U.S.C. § 1 (2000). There is a long history of interaction between the patent system and antitrust law in the United States. Multinational chemical and pharmaceutical corporations used patent portfolio cross-licensing schemes to undermine Sherman Act legislation as long ago as the 1920s. *See generally* Peter Drahos, Information Feudalism: Who Owns the Knowledge Economy? 43-60 (2002) (describing the rise of international patent-holding cartels in the chemical and pharmaceutical industries to circumvent antitrust regulations).
    145.   *See* Racketeer Influenced and Corrupt Organizations Act, codified at 18 U.S.C §§ 1961-1968 (2000).