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Fixing Notice Failure: How to Tame the Trolls and Restore Balance to the Patent System

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FIXING NOTICE FAILURE: HOW TO TAME THE TROLLS AND RESTORE BALANCE TO THE PATENT SYSTEM

ABSTRACT

Patent litigation has become more frequent, more uncertain, and more expensive. Much of this can be traced to the rise of patent trolls asserting vague and uncertain software patents. Trolls have been derided as bringing frivolous and vexatious suits against productive companies, sapping the very same innovativeness that the patent system is supposed to encourage. Instead, companies are subject to nuisance-value suits as an ordinary course of business; for less established companies, such suits can threaten their very existence. Often, because of uncertain rules about claim construction and the granting of very broad patents, the accused infringer has no notice of any potential infringing behavior until the suit is brought or a demand letter is sent. This lack of notice—or “notice failure” as it is called—is a serious problem that disturbs the careful balance the patent system tries to achieve. In exchange for a limited monopoly in the invention, the patentee must disclose to the public what was invented. But if the public is not given proper notice of the full scope of the invention, the quid pro quo is turned on its head, favoring the patentee at the expense of the public. This Note proposes strengthening the notice requirement of the patent system. In particular, damages should be limited to behavior occurring after actual notice is given to an accused infringer where a patent troll asserts a software patent.

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INTRODUCTION

Patent reform is being clamored for from various quarters—from Industry,¹ from the Academy,² from members of the Judiciary,³ from the Press,⁴ from public interest groups,⁵ and even from some less traditional sources.⁶ The passage of the America Invents Act (AIA),⁷ although helpful to some degree,⁸ largely ignored the most pressing problems of the patent system.⁹ Among these pressing problems are: overcompensating infringement

¹ See, e.g., *About the Coalition*, COALITION FOR PATENT FAIRNESS, <http://www.patentfairness.org/learn/about> (last visited Feb. 24, 2014).

² See generally, DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009). As further evidence of continuing academic interest in the subject, see the recent conference on software patents at Santa Clara Law. See Conference Report, High Tech Law Inst., *Solutions to the Software Patent Problem* (Nov. 16, 2012), <http://law.scu.edu/hightech/2012-solutions-to-the-software-patent-problem/>.

³ See, e.g., Richard A. Posner, *Do Patent and Copyright Law Restrict Competition and Creativity Excessively?*, BECKER-POSNER BLOG (Sept. 30, 2012, 10:30 PM), <http://www.becker-posner-blog.com/2012/09/do-patent-and-copyright-law-restrict-competition-and-creativity-excessively-posner.html> [hereinafter Posner, *Competition and Creativity*] (“My general sense ... is that patent protection is on the whole excessive and that major reforms are necessary.”); Richard A. Posner, *Why There Are Too Many Patents in America*, ATLANTIC (July 12, 2012, 10:20 AM), <http://www.theatlantic.com/business/archive/2012/07/why-there-are-too-many-patents-in-america/259725> [hereinafter Posner, *Too Many Patents*]. But see Richard A. Epstein, *Apple v. Motorola: Are There Really Too Many Patents in America?*, NEWSWEEK (Aug. 6, 2012, 1:00 AM), <http://www.newsweek.com/apple-v-motorola-are-there-really-too-many-patents-america-64489>.

⁴ See, e.g., Christopher Danzig, *A Closer Look at the ‘Chaos’ of the American Patent System*, ABOVE THE LAW (Oct. 9, 2012, 3:12 PM), <http://abovethelaw.com/2012/10/a-closer-look-at-the-chaos-of-the-american-patent-system> (describing problems of the patent system and popular press accounts of the same); Steven Levy, *The Patent Problem*, WIRED (Nov. 13, 2012, 6:30 AM), <http://www.wired.com/opinion/2012/11/ff-steven-levy-the-patent-problem/all/>; Brad Plumer, *Everything You Need to Know About Patent Reform in One Post*, WASH. POST (Sept. 6, 2011, 5:30 PM), http://www.washingtonpost.com/blogs/ezra-klein/post/everything-you-need-to-know-about-patent-reform-in-one-post/2011/09/06/gIQAOD4V7J_blog.html.

⁵ See *Patents*, ELECTRONIC FRONTIER FOUND., <https://www EFF.org/patent> (last visited Feb. 24, 2014).

⁶ See David Holmes, *The Patent Song*, PANDODAILY (Oct. 1, 2012), <http://pandodaily.com/2012/10/01/pandohouse-rock-the-patent-song> (singing about patent reform with such lyrics as “we all hate trolls right?” and “reform is the only way”).

⁷ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified as amended in scattered sections of 35 U.S.C.).

⁸ See Tracie L. Bryant, Note, *The America Invents Act: Slaying Trolls, Limiting Joinder*, 25 HARV. J.L. & TECH. 687, 688–90 (2012) (arguing that the joinder provision of the AIA may decrease a patent troll’s litigious activity).

⁹ See, e.g., BRIAN T. YEH, CONG. RESEARCH SERV., R42668, AN OVERVIEW OF THE “PATENT TROLLS” DEBATE (2013) (“However, the AIA contains relatively few provisions

verdicts;¹⁰ a vague and difficult-to-apply standard for determining “reasonable royalties”;¹¹ uncertain patent scope;¹² the high cost of defending even spurious patent claims;¹³ and the flurry of “troll” suits that all this invariably encourages.¹⁴ Despite widespread attention being brought to these issues,¹⁵

that arguably might impact [NPEs]”); Rob Wheeler & James Allworth, *U.S. Patent Overhaul Won't Help Innovators*, HARV. BUS. REV. BLOG (Sept. 15, 2011, 9:38 AM), http://blogs.hbr.org/cs/2011/09/the_america_invents_act_rearra.html (concluding that the AIA does little to nothing about patent law's biggest problems, including fuzziness of patent scope).

¹⁰ See, e.g., S. REP. NO. 111-18, at 8 (2009) (describing testimony that “damage awards ... are too often excessive and untethered from the harm that compensatory damages are intended to measure” (citations omitted)); Mark A. Lemley, *Are Universities Patent Trolls?*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611, 630–31 (2008) (arguing that royalty calculations are often disproportionate to the contribution of the infringed patent); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2044 (2007) (arguing that patentees recover “more than their fair share” owing to damage calculations). *But see* David W. Opderbeck, *Patent Damages Reform and the Shape of Patent Law*, 89 B.U. L. REV. 127, 130 (2009) (describing a statistical analysis of patent verdicts that fails to support a trend of large verdicts); Michael J. Mazzeo et al., *Patent Damages and the Need for Reform*, PATENTLY-O (Mar. 3, 2011, 5:19 AM), <http://www.patentlyo.com/patent/2011/03/patent-damages.html> (describing an empirical study suggesting that infringement damage awards are not excessive, except for some outliers).

¹¹ See, e.g., Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1688 (2010) (“Determining a fair and a reasonable royalty ... seem[s] often to involve more the talents of a conjurer than those of a judge.” (quoting *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010))); Merritt J. Hasbrouck, Note, *Protecting the Gates of Reasonable Royalty: A Damages Framework for Patent Infringement Cases*, 11 J. MARSHALL REV. INTELL. PROP. L. 192, 198–205 (2011) (blaming the *Georgia-Pacific* factors for being confusing and hard to apply).

¹² See, e.g., Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1744 (2009) (“Patent law has provided none of the certainty associated with the definition of boundaries in real property law.”).

¹³ See, e.g., James Bessen & Michael J. Meurer, *Lessons for Patent Policy from Empirical Research on Patent Litigation*, 9 LEWIS & CLARK L. REV. 1, 2 (2005) (describing median litigation costs under various circumstances).

¹⁴ See, e.g., YEH, *supra* note 9, at 8–13. *But see* John M. Golden, “Patent Trolls” and Patent Remedies, 85 TEX. L. REV. 2111 (2007) (arguing for a more nuanced approach and that NPEs should not be categorically denied injunctions).

¹⁵ See, e.g., Patent Reform Act of 2008, S. 1145, 110th Cong. § 4 (2008); Patent Reform Act of 2007, H.R. 1908, 110th Cong. § 5 (2007); *Abusive Patent Litigation: Hearing Before the Subcomm. on Courts, the Internet, & Intellectual Prop. of the H. Comm. on the Judiciary*, 113th Cong. (2013); *Patent Trolls: Fact or Fiction?: Hearing Before the Subcomm. on Courts, the Internet, & Intellectual Prop. of the H. Comm. on the Judiciary*, 109th Cong. (2006); Press Release, White House Office of the Press Sec’y, FACT SHEET: White House Task Force on High-Tech Patent Issues (June 4, 2013), <http://www.whitehouse.gov>

there are disagreements about what, if anything, ought to be done.¹⁶ In particular, the software and pharmaceutical industries are often seen as occupying opposing camps, a result of the underlying differences between those two groups.¹⁷

Some worry that large patent-infringement verdicts are becoming a trend.¹⁸ Just recently, Apple won more than \$1 billion in a verdict from Samsung, largely from patent infringement claims.¹⁹ But even where a case results in a finding of non-infringement or invalidity, it may be a pyrrhic victory for many companies that are unable to shoulder large legal expenses.²⁰ Given the high stakes, the uncertainty involved, and the costs of even successfully defending a patent-infringement action, there are strong incentives for companies—small, medium, or large—to settle.²¹ Enter patent trolls—known among polite company as Non-Practicing Entities (NPEs).²² Attempting to exploit this situation to their advantage and effectively immune from infringement counterclaims, NPEs target a wide array of companies, expecting many to settle quickly.²³ The economic costs from this practice are enormous, estimated by some at \$29 billion for

www.whitehouse.gov/the-press-office/2013/06/04/fact-sheet-white-house-task-force-high-tech-patent-issues; *see also supra* notes 1–6.

¹⁶ *See, e.g.,* YEH, *supra* note 9, at 1 (stating that Congress put few provisions in the AIA to address NPEs because of “lively debate over what, if anything, should be done about them”).

¹⁷ *See, e.g.,* Megan L. Wiggins, Note, *Patent Reform and Damages Apportionment: Addressing the Concerns of Industry-Scale Users of the U.S. Patent System Without Legislatively Mandating a “Specific Contribution over the Prior Art,”* 40 SETON HALL L. REV. 273, 283–291 (2010); Posner, *Competition and Creativity*, *supra* note 3; Posner, *Too Many Patents*, *supra* note 3.

¹⁸ *See supra* note 10 and accompanying text.

¹⁹ *See* Joel Rosenblatt, *Apple’s \$1 Billion Verdict May Lead to Samsung Sales Ban*, BLOOMBERG (Aug. 26, 2012, 2:03 AM), <http://www.bloomberg.com/news/2012-08-25/apple-s-1-billion-verdict-may-lead-to-samsung-sales-ban.html>.

²⁰ *See* KEITH E. MASKUS, COUNCIL ON FOREIGN RELATIONS, *REFORMING U.S. PATENT POLICY: GETTING THE INCENTIVES RIGHT* 15–17 (2006); *supra* note 13.

²¹ *See, e.g.,* YEH, *supra* note 9, at 1 (“The vast majority [of infringement cases] end in settlements because litigation is risky, costly, and disruptive for defendants”); William M. Landes, *An Empirical Analysis of Intellectual Property Litigation: Some Preliminary Results*, 41 HOUS. L. REV. 749, 750–54 (2004) (finding that most patent cases end in settlement, more so than for civil litigation generally).

²² *See, e.g.,* Michael Risch, *Patent Troll Myths*, 42 SETON HALL L. REV. 457, 459 (2012); Steve Seidenberg, *Troll Control*, A.B.A. J., Sept. 2006, at 51; Bryant, *supra* note 8, at 688.

²³ Jason Rantanen, *Slaying the Troll: Litigation as an Effective Strategy Against Patent Threats*, 23 SANTA CLARA COMPUTER & HIGH TECH. L.J. 159, 160–61 (2006).

2011, or over \$1.5 trillion over the period from 1990 to 2010.²⁴ While NPEs have their defenders, the value they add to the patent system or the economy more broadly is far from clear.²⁵ Indeed, some observers have concluded from all this that patents have an overall deleterious effect on innovation, contrary to their intended and constitutional purpose.²⁶ Some members of Congress have proposed legislation directly targeting the pernicious effects of NPEs on the patent system.²⁷ Even the FTC—following the lead of the President—is planning an inquiry into frivolous patent lawsuits and the behavior of patent trolls.²⁸

Concerns with the state of patent law are especially pressing for technology companies.²⁹ Software patents, in particular, have been the subject of intense dispute.³⁰ Technology companies are now acquiring large patent

²⁴ See James E. Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. (forthcoming 2014), available at <http://ssrn.com/abstract=2091210> (estimating \$29 billion of direct costs in 2011); James E. Bessen et al., *The Private and Social Costs of Patent Trolls* (Bos. Univ. Sch. of Law, Law & Econ. Research Paper No. 12-34, 2011), available at <http://ssrn.com/abstract=1930272> (finding over half a trillion dollars of loss to defendants from 1990–2010, resulting in “reduced innovation incentives”).

²⁵ See Risch, *supra* note 22, at 497–99; see also *supra* note 24.

²⁶ See, e.g., Michele Boldrin & David K. Levine, *The Case Against Patents* (Fed. Reserve Bank of St. Louis, Working Paper No. 2012-035A 2012), <http://research.stlouisfed.org/wp/2012/2012-035.pdf>.

²⁷ See H.R. 6245, 112th Cong. (2012) (requiring NPEs to pay attorneys’ fees if they lose, but applying only to software patents); H.R. 845, 113th Cong. (2013) (same, but applying generally to all utility patents); see also Lisa Shuchman, *Revamped SHIELD Act Again Seeks to Thwart ‘Patent Trolls,’* CORP. COUNS. (Feb. 28, 2013, 5:06 PM), <http://www.corpcounsel.com/id=1202590122842>.

²⁸ See Edward Wyatt, *F.T.C. Is Said to Plan Inquiry of Frivolous Patent Lawsuits*, N.Y. TIMES (June 19, 2013), <http://www.nytimes.com/2013/06/20/business/ftc-is-said-to-plan-inquiry-of-frivolous-patent-lawsuits.html>.

²⁹ See, e.g., YEH, *supra* note 9, at 15; Posner, *Competition and Creativity*, *supra* note 3.

³⁰ See, e.g., Orin S. Kerr, *Computer and the Patent System: The Problem of the Second Step*, 28 RUTGERS COMPUTER & TECH. L.J. 47, 48–49, 51–52 (2002); Andrew Nieh, Note, *Software Wars: The Patent Menace*, 55 N.Y.L. SCH. L. REV. 295, 299 (2010); Dennis Crouch, *Making Software Patents Transparent and Understandable: Begin by Determining Whether Software Is Patentable*, PATENTLY-O (Oct. 9, 2012, 11:35 PM), <http://www.patentlyo.com/patent/2012/10/making-software-patents-transparent-and-understandable-begin-by-determining-whether-software-is-patentable.html>; Mark Rawls, *On Software Patents and Patent Trolls*, WM. & MARY STUDENT INTELL. PROP. SOC’Y BLOG (Dec. 8, 2011), <http://sips.blogs.wm.edu/2011/12/08/on-software-patents-and-patent-trolls/>; Michael Risch, *Curing the Problem of Software Patents*, GROKLAW (June 10, 2012, 6:44 PM), <http://www.groklaw.net/articlebasic.php?story=20120610180253648>. The issue is especially timely, given the Supreme Court’s recent § 101 subject-matter cases and the Federal Circuit’s *en banc* rehearing of *CLS Bank Int’l v. Alice Corp.*, 717 F.3d 1269 (Fed. Cir. 2013). See Dennis Crouch, *Federal Circuit to Announce Whether Software Is Patentable?*, PATENTLY-O (Oct. 9, 2012, 12:35 PM), <http://www.patentlyo.com/patent/20>

portfolios, mostly as a defensive position.³¹ These patent portfolios can then be used either for cross-licensing or as an implicit threat of an infringement counterclaim if sued.³² The so-called “patent thicket”³³—the reality that sophisticated technological products are covered by thousands or hundreds of thousands of patents—encourages this strategy of mutually assured destruction. Whatever the value of this practice, it offers no defense against NPEs who do not produce anything to be countersued over.³⁴ Particularly troublesome where software patents are concerned is what is called “notice failure,” where broadly written claims and lax enforcement of definiteness requirements mean that companies often do not know they

12/10/federal-circuit-to-announce-whether-software-is-patentable-en-banc-rehearing-on-section-101-issues.html.

³¹ See, e.g., MASKUS, *supra* note 20, at 18; Rawls, *supra* note 30. But such portfolios are not invariably defensive. Consider this story, for instance:

An awkward silence ensued. The blue suits did not even confer among themselves. They just sat there, stonelike. Finally, the chief suit responded. “OK,” he said, “maybe you don’t infringe these seven patents. But we have 10,000 U.S. patents. Do you really want us to go back to Armonk [IBM headquarters in New York] and find seven patents you do infringe? Or do you want to make this easy and just pay us \$20 million?”

After a modest bit of negotiation, Sun cut IBM a check, and the blue suits went to the next company on their hit list.

Gary L. Reback, *Patently Absurd*, FORBES (June 24, 2002), <http://www.forbes.com/asp/2002/0624/044.html>.

³² See, e.g., MASKUS, *supra* note 20, at 18; Rob Goodier, *Patent Trolls: How Bad Is the Problem?*, POPULAR MECHS. (Oct. 25, 2011, 4:00 PM), <http://www.popularmechanics.com/technology/gadgets/news/patent-trolls-how-bad-is-the-problem> (“Large stockpiles of patents can lead to a legal détente between tech giants simply because both companies own enough patents to sue the other repeatedly.”); Rawls, *supra* note 30. Curiously, given the purpose of the patent system, such patent portfolios are not, as a rule, used for innovation. See Boldrin & Levine, *supra* note 26, at 7 (“To learn more about the actual effect of patents in the real world, let us consider the response of Google to being pursued legally by a large competitor. One response is their recent purchase of Motorola Mobility.... Why the interest of Google? It is buying Motorola Mobility for its patent portfolio. *Not for the ideas and innovations in that portfolio*—few if any changes or improvements to Google’s Android operating system will result from the ownership or study of these software patents. *The purpose of obtaining this patent portfolio is purely defensive*: it can be used to countersue Apple and Microsoft and blunt their legal attack on Google.” (emphasis added)).

³³ See, e.g., YEH, *supra* note 9, at 10–11.

³⁴ See, e.g., Ahmed J. Davis & Karolina Jesien, *The Balance of Power in Patent Law: Moving Towards Effectiveness in Addressing Patent Troll Concerns*, 22 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 835, 837 (2012) (“Because trolls are non-producing entities, they are immune from infringement countersuits and the coincident bargaining for cross licensing agreements.”); Goodier, *supra* note 32.

may be infringing a patent until an infringement action is brought.³⁵ Technology companies have not been shy about raising these concerns.³⁶ Indeed, many of the members of the Coalition for Patent Fairness—such as Google, Dell, Oracle, CISCO—are technology companies.³⁷ Neither has the problem gone unnoticed at the Patent Office.³⁸

One way to counter the problems of notice failure and curb the more troubling aspects of NPEs is to strengthen notice requirements. Notice requirements, although weak, especially with regard to NPEs, are not unknown in the patent law.³⁹ Generally, a company that manufactures a patented product must mark the product with its patent number.⁴⁰ That mark constitutes constructive notice to potential infringers. If a company fails to mark a product, damages do not begin to accrue until actual notice is given by the patentee to an infringer.⁴¹ The marking requirement is only applicable when there is a product to mark, however, and so NPEs generally are not subject to any such marking requirement because they do not (by definition) practice their patents. Therefore, the only notice that potential infringers have in NPE suits is the patent as filed with the USPTO. This notice, especially for software patents, is often inadequate.

This Note will argue that for software patents being asserted by NPEs, actual notice ought to be given to alleged infringers before damages begin to accrue.⁴² Part I of this Note will discuss how this requirement best enforces

³⁵ See, e.g., YEH, *supra* note 9, at 9 (describing notice failure and the underlying causes of notice failure as both “fuzzy boundaries” of claims and the infeasibility of searching through existing patents in this field); BURK & LEMLEY, *supra* note 2, at 46–72.

³⁶ See, e.g., *Crossing the Finish Line on Patent Reform: What Can and Should be Done: Hearing Before the Subcomm. on Intellectual Prop., Competition, & the Internet of the H. Comm. on the Judiciary*, 112th Cong. (2011); Brendon Chase, *IBM Calls for Patent Reform*, TECHREPUBLIC (April 11, 2005, 3:29 AM), <http://www.techrepublic.com/article/ibm-calls-for-patent-reform/6310415>; Evan Ramstad, *Google Legal Chief: Patent Reform a Balancing Act*, WALL ST. J. DIGITS BLOG (Oct. 9, 2012, 6:21 AM), <http://blogs.wsj.com/digits/2012/10/09/google-legal-chief-patent-reform-a-balancing-act>.

³⁷ See *About the Coalition*, COALITION FOR PAT. FAIRNESS, <http://www.patentfairness.org/learn/about> (last visited Feb. 24, 2014).

³⁸ See David Kappos, Under Sec’y of Commerce for Intellectual Prop. & Director of the USPTO, Keynote Address at the Center for American Progress: An Examination of Software Patents (Nov. 20, 2012), http://www.uspto.gov/news/speeches/2012/kappos_CAP.jsp (“[W]e know that inconsistency in software patent issuance causes uncertainty in the marketplace and can cause threats of litigation that in turn can stifle innovation and deter new market entrants.”).

³⁹ See *infra* Part III.

⁴⁰ See 35 U.S.C.A. § 287(a) (West 2014); see also *infra* Part III.

⁴¹ See § 287(a); see also *infra* Part III.

⁴² This Note focuses only on software patents asserted by NPEs; the case for requiring notice here is particularly acute. Where a product is marked, but a software patent is later

the public purposes of the patent system. Part II will discuss the rationale of the marking requirement, and why it is logical to extend this notice requirement to NPEs and software patents. Part III will consider what a notice requirement might look like in practice.

I. SOFTWARE PATENTS AND THE PURPOSES OF THE PATENT SYSTEM

This Note will argue that software patents are different from other types of patents; that patents affect the software industry differently than other industries; that because of this, an individualized approach toward software patents is proper; and, that this individualized approach, guided by the public purposes of the patent system, should strengthen notice requirements, particularly being directed at NPEs.

A. Software Patents Are Different from Other Patents

Software patents are different, fundamentally, from other types of patents, and in particular, from those in the pharmaceutical or biotechnology fields.⁴³ Compared to other fields, software development is cheap.⁴⁴ Software patents tend to be more abstract, and, consequently, the metes and bounds of a patent claim in software is much fuzzier than in other fields.⁴⁵ Additionally, the software industry relies less on patent protection than other industries, especially the pharmaceutical or biotechnology industries.⁴⁶ Software patents are also different, empirically, from other patents, in that they tend to have higher rates of litigation and higher rates of claim construction problems.⁴⁷

asserted against an unrelated product, it may be doubtful that the marking actually provided much notice. Additionally, where a company that manufactures something asserts only method claims—and therefore is not subject to the marking requirement, *see infra* Part III—it is also doubtful that the accused infringer has much notice. This Note does not consider whether the proposal should be extended to these cases.

⁴³ See BURK & LEMLEY, *supra* note 2, at 188–93 (finding empirical evidence that software patents are different from other patents and arguing this is due to the abstractness of software); *supra* note 17.

⁴⁴ See, e.g., Posner, *Competition and Creativity*, *supra* note 3 (contrasting the high costs of the pharmaceutical industry with the relatively modest costs of software development); Wiggins, *supra* note 17, at 284–85; Clarisa Long, *Our Uniform Patent System*, FED. LAW., Feb. 2008, at 44, 45 (“The cost of much innovation in software today is relatively low when compared with the cost required by other industries”).

⁴⁵ See BURK & LEMLEY, *supra* note 2, at 187 (“Such patents often have unclear boundaries and give rise to opportunistic litigation.”).

⁴⁶ See, e.g., MASKUS, *supra* note 20, at 20–21; Nieh, *supra* note 30, at 309–15; Posner, *Competition and Creativity*, *supra* note 3.

⁴⁷ See BURK & LEMLEY, *supra* note 2, at 152–53, 187 (“[Software] patents had high rates of litigation and high rates of claim-construction review on appeal.”).

1. Software Development Is Cheap Compared to Other Fields of Innovation

It is much cheaper to develop new software than it is to develop a new drug or other product.⁴⁸ In pharmaceutical development, huge outlays are spent on research and development, drug testing, and regulation compliance.⁴⁹ Moreover, the vast majority of drugs turn out to be ineffective or otherwise do not make it to market, increasing the real costs of development.⁵⁰ It takes on average ten to fifteen years to develop a new drug.⁵¹ And, once developed, these drugs typically are useful at least throughout the life of the patent. Indeed, generic drugs, typically entering the market after patent expiration, account for a large portion of the total amount of filled prescriptions.⁵² In addition, this research and development is being spent on relatively few drugs, for which relatively few patents are issued.⁵³

In software development, in contrast to pharmaceutical and most other development, innovation tends to happen quickly and incrementally.⁵⁴ Instead of expensive capital investments, often the primary cost in software development is the labor of the software developer.⁵⁵ In addition to innovation being quick and incremental—and perhaps because of it—once developed, software has a relatively short life span, being quickly superseded by other technology. And the large sums that big technology companies

⁴⁸ See Posner, *supra* note 3.

⁴⁹ *Pharmaceutical Patents: The Value of Pharmaceutical Patents & Strong Intellectual Property Protection*, INNOVATION.ORG, http://www.innovation.org/documents/File/Pharmaceutical_Patents.pdf.

⁵⁰ *Id.* at 6 (stating that only 1 in 5,000–10,000 compounds tested reach consumers and that only 3 in 10 drugs generate enough money to match or exceed the research and development costs for the drug).

⁵¹ *Id.* at 4.

⁵² See, e.g., *Generic Drug Entry Prior to Patent Expiration*, FTC (July 2002), http://www.ftc.gov/sites/default/files/documents/reports/generic-drug-entry-prior-patent-expiration-ftc-study/genericdrugstudy_0.pdf (identifying the large market share that generic drugs have).

⁵³ Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1590 (2003) (“In some industries, such as chemistry and pharmaceuticals, a single patent normally covers a single product.”); Lisa Larrimore Ouellette, Note, *How Many Patents Does It Take to Make a Drug? Follow-on Pharmaceutical Patents and University Licensing*, 17 MICH. TELECOMM. & TECH. L. REV. 299, 300 (2010) (finding on average 3.5 patents per small-molecule drug).

⁵⁴ Wiggins, *supra* note 17, at 283.

⁵⁵ See, *Software Development Cost Estimating Guidebook*, SOFTWARE TECH. SUPPORT CTR. 4–6 (Oct. 2010), http://www.stsc.hill.af.mil/consulting/sw_estimation/softwareguidebook2010.pdf (describing major cost factors of software development, which are mostly related to expected developer time).

spend on research and development,⁵⁶ to the extent that such research covers patentable subject matter, results in a large number of patents.⁵⁷ By way of comparison to the pharmaceutical industry, which also spends large sums on research and development, in 2012 Glaxo Group Limited, the subsidiary through which GlaxoSmithKline produces pharmaceuticals,⁵⁸ received sixty-eight patents to IBM's 6457—and many of the top patent recipients in terms of total patents issued by year are technology companies.⁵⁹ The reality that complex technical products are covered by a large number of patentable subcomponents—the so-called “patent thicket”⁶⁰—also helps to explain why software development produces many patentable components. Indeed, some estimate that a smartphone is covered by hundreds of thousands of patents.⁶¹ In contrast, a given drug developed by a pharmaceutical company is covered only by a few patents.⁶²

These differences are not superficial. Because software development does not require the huge outlays that pharmaceutical research does, development can happen more quickly and by a more diverse set of actors. That innovation in software is incremental means there is less risk that huge sums of capital and time will be spent on research paths that lead nowhere, which is a real and constant risk for pharmaceutical development where most drug ideas do not reach an end consumer and most drugs even at the later stages of development are not successful.⁶³ That software development may produce many patentable components and subcomponents,

⁵⁶ See Posner: *Who Needs Patents, Anyway?*, IPNAV BLOG (July 19, 2012), <http://www.ipnav.com/blog/posner-who-needs-patents-anyway/> (claiming that “[o]f the top 10 US companies ranked by R&D investment, only four are involved in pharmaceuticals,” and “the number one company is Microsoft,” with Cisco, Oracle, and Google also on the top-ten list).

⁵⁷ For instance, compare *supra* note 53 with estimates that a smartphone contains over 250,000 patentable components. See Mike Masnick, *There Are 250,000 Active Patents that Impact Smartphones*, TECHDIRT (Oct. 18, 2012, 8:28 AM), <http://www.techdirt.com/blog/innovation/articles/20121017/10480520734/there-are-250000-active-patents-that-impact-smartphones-representing-one-six-active-patents-today.shtml>.

⁵⁸ *Company Overview of Glaxo Group Limited*, BLOOMBERG BUSINESSWEEK, <http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=6450664> (last visited Feb. 24, 2014).

⁵⁹ See PATENT TECHNOLOGY MONITORING TEAM, U.S. PATENT & TRADEMARK OFFICE, PATENTING BY ORGANIZATIONS (UTILITY PATENTS) 2012 B1-1, B1-20 (2012), http://www.uspto.gov/web/offices/ac/ido/oeip/taf/topo_12.pdf (ranking organizations with forty or more patents granted in 2012 by number of patents granted).

⁶⁰ See *supra* note 9 and accompanying text.

⁶¹ See *supra* note 57 and accompanying text.

⁶² See *supra* note 53 and accompanying text.

⁶³ See *supra* notes 49–50 and accompanying text.

for any given product, means that on average a given patent costs less than for pharmaceutical research, where expensive drug research will lead to only a few patents.⁶⁴ That software innovation is quickly superseding older products further heightens this disparity between the cost of an individual software patent and an individual pharmaceutical patent, especially because pharmaceutical research takes so long—ten to fifteen years on average.⁶⁵ Moreover, there are a fair amount of software development activities—fixing bugs, improving user interfaces, expanding system compatibility, documentation—that are not likely to lead to new patents. In contrast, most pharmaceutical research has, as a long-term aim, the development of a new and patentable drug. This makes a simple comparison of the research and development costs of large technology companies and drug companies misleading.⁶⁶ The net effect of all this is that it is much cheaper to come up with a patentable software claim than a patentable pharmaceutical claim. The worth of software patents is quite different from other types of patents, especially pharmaceutical patents.

2. *Software Patents Are More Indeterminate than Other Patents*

Software patents have boundaries that are fuzzier than other patents; that is, notice failure is more pronounced for software patents than it is for other types of patents.⁶⁷ This is in part because software claims tend to be more abstract than other types of claims.⁶⁸ There are empirically more claim construction problems with software patents, which would be expected if

⁶⁴ See *supra* notes 53, 57–62 and accompanying text.

⁶⁵ See *supra* note 49 and accompanying text.

⁶⁶ Such as can be seen in *supra* note 56; see also Boldrin & Levine, *supra* note 26, at 4–6. It is also worth noting that software patents are not exclusive to technology companies. See, e.g., JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 190 (2008) (“The general concern is over software *patents*, not the software *industry* per se. This distinction is important because almost all software patents are obtained by firms *outside* the software industry.”).

⁶⁷ See *supra* note 45; BESSEN & MEURER, *supra* note 66, at 150–51 (giving reasons why patent notice failure became worse during the 1990s, including decisions regarding claim construction, the use of continuing patent applications, changes in software patents allowing for more abstract claims, and the increase in number of patents); *id.* at 189, 192 (describing the history of and continued opposition to software patents by technology companies); *id.* at 194 (“We believe that, on average, software patents suffer notice problems more acutely than patents drawn from most other areas of technology.”). See *generally id.* at 46–72 (discussing notice failure generally, and the importance of clear boundaries).

⁶⁸ See BESSEN & MEURER, *supra* note 66, at 187 (“We argue that there is, in fact, something crucially different about software: software is an *abstract* technology.”).

the scope of software patents were more difficult to determine than other types of patents.⁶⁹ Indeed, there is almost twice as high a reversal rate for claim construction decisions involving software patents compared to patents generally.⁷⁰ As Bessen and Meurer argue, much of this may be because software is, itself, an abstract endeavor.⁷¹ Some of the high reversal rate may be explained by the indeterminacy of software claims, or because of “complex software claim construction rules.”⁷² The uncertain nature of claim construction is a serious problem.⁷³ Miller concludes that, while “claim construction law appears to be working quite well for non-software patents [m]y results demonstrate that the same cannot be said of software claim construction, which is highly unpredictable.”⁷⁴ For pharmaceutical patents, on the other hand, claims tend to be much more precise.⁷⁵ Chemical formulas are anything but abstract.⁷⁶ That is not to say such claims are not broad, but that the outer boundaries are, on average, more determinate than for software claims.

Another issue with software patents is the uncertainty over what is patent eligible. Many software patents are business method patents⁷⁷—patents on the way of doing business—and have become common-place in the wake of *Bilski v. Kappos*.⁷⁸ That decision—dealing with a patent on a method for hedging risk—did little, however, to provide firm footing to the nature of patentable subject matter.⁷⁹ While the Court in *Bilski* held that no

⁶⁹ See *supra* note 2.

⁷⁰ See Shawn P. Miller, Do “Fuzzy” Software Patent Boundaries Explain High Claim Construction Reversal Rates? 5 (Feb. 7, 2013) (unpublished manuscript), available at <http://ssrn.com/abstract=2139146> (finding a 40 percent reversal rate for software patent claims, and an 18 percent reversal rate across all other patent claims).

⁷¹ See *supra* note 66.

⁷² See Miller, *supra* note 70, at 27.

⁷³ See BESSEN & MEURER, *supra* note 66, at 200 (“Nevertheless, in a broad range of cases, significant uncertainty remains as to whether abstract claims would be upheld, and, if so, how they would be interpreted if challenged in court.”).

⁷⁴ See Miller, *supra* note 70, at 24.

⁷⁵ BESSEN & MEURER, *supra* note 66, at 153 (describing the “clear boundaries provided by patents on chemical structures and compositions”).

⁷⁶ *Id.*

⁷⁷ See *id.* at 187 (claiming that “patents on business methods ... are largely software patents”).

⁷⁸ 130 S. Ct. 3218 (2010); see Mark A. Lemley et al., *Life After Bilski*, 63 STAN. L. REV. 1315, 1317–25 (2011) (“The patentability of software and business methods has a long and tortured history.”).

⁷⁹ See Lemley et al., *supra* note 78, at 1316 (“Put simply, the problem is that no one understands what makes an idea ‘abstract,’ and hence ineligible for patent protection”) (citation omitted); see also Mark Connolly, Note, *The Search for America’s Most Eligible Patent: The Impact of the Bilski Decision on Obtaining Patents for Processes and Business*

rule categorically barring business method patents was appropriate, it did not itself provide any rule to make clear what was subject-matter eligible.⁸⁰ The problem has been compounded lately with a number of different subject-matter cases, which have so far not provided clear guidance as to what is patentable subject matter. In *Prometheus*, the Supreme Court recently found that a patent lacked subject matter eligibility under the law-of-nature exception.⁸¹ In *Myriad*, the Court reversed-in-part the Federal Circuit, after having remanded the case in light of *Prometheus*, finding that naturally occurring genes could not be patented but so-called cDNA could be patented.⁸² The Federal Circuit, for its part, although not providing any clear guidance, has dealt with a number of software-related subject-matter-eligibility cases, including *Ultramercial*, *CLS Bank*, and *Bancorp*.⁸³

Beyond uncertain subject matter requirements under § 101, lax definiteness requirements under § 112 further contribute to vague and unclear claims.⁸⁴ While subject matter and definiteness concerns are not unique to software patents, they apply more to software patents than other patents. Business method patents, of which an appreciable subset are software patents,⁸⁵ are particularly sensitive to subject matter concerns. Further, because many software claims are already abstract,⁸⁶ any additional vagueness that lax definiteness requirements may impose only heightens the problem of determinacy.

An additional wrinkle to the notice failure of software patents is that software patents are hard to search.⁸⁷ This is, in part, because of poor indexing and the ineffectiveness of keyword searching.⁸⁸ When dealing with broad patent claims, it is difficult to effectively index everything such a

Methods, 3 WM. & MARY BUS. L. REV. 575, 578 (2012) (noting that the decision was “unhelpful in applying a prospective rule regarding business method patents”).

⁸⁰ See Lemley et al., *supra* note 78, at 1316; Connolly, *supra* note 79, at 578.

⁸¹ *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

⁸² *Ass’n for Molecular Pathology v. Myriad Genetics*, 133 S. Ct. 2107 (2013).

⁸³ *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013); *CLS Bank Int’l v. Alice Corp.*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc), *cert. granted*, 134 S. Ct. 734 (Dec. 6, 2013); *Bancorp Servs., LLC v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266 (Fed. Cir. 2012).

⁸⁴ See YEH, *supra* note 9, at 9–10.

⁸⁵ See BESSEN & MEURER, *supra* note 66.

⁸⁶ See *id.*

⁸⁷ See Christina Mulligan & Timothy B. Lee, *Scaling the Patent System*, 68 N.Y.U. ANN. SURV. AM. L. 289, 9–16 (2012). See generally Stephen Lindholm, Note, *Marking the Software Patent Beast*, 10 STAN. J.L. BUS. & FIN. 82, 96–108 (2005) (discussing ways in which software patents are harder to search than other types of patents).

⁸⁸ See Lindholm, *supra* note 87, at 96.

claim might reach.⁸⁹ Another issue is that software patents are classified by their specific industrial use rather than the algorithm that the claims rely on.⁹⁰ That is, although a claim might describe a novel algorithm which is used in one field, that claim might also cover a use of the same algorithm for some unrelated field—but it may not be an obvious thing to search for, to an innovator in the other field. Keyword searches are of limited value because computer science is an emerging field and terms have not been fixed to the degree that they are in other arts; because terms such as “data” are broad and, in any event, do not narrow the search meaningfully; and, because of the rapid pace of technological innovation, terms are sometimes changed, or no term yet exists to describe the innovation.⁹¹ Ultimately, the difficulty of searching for patent claims and the indeterminacy of many such claims compound the problems of notice failure for software patents.

3. The Software Industry Relies Less on Patent Protection than Other Industries

The software industry relies less on patent protection than other industries, especially the pharmaceutical or biotechnology industries.⁹² Whereas the pharmaceutical industry clamors for more and stronger patent protection,⁹³ the software industry does just the opposite.⁹⁴ The reason that the AIA—the recent patent reform act—did not do much to address NPEs or notice failure is that while technology companies testified to Congress about the need for such reform,⁹⁵ pharmaceutical companies testified to Congress about the need for stronger patent protection for their industry,⁹⁶ resulting in stalemate.⁹⁷

⁸⁹ *Id.* at 98.

⁹⁰ *Id.*

⁹¹ *Id.* at 104–06.

⁹² *See supra* note 46.

⁹³ *See, e.g.,* Long, *supra* note 44, at 45; Wiggins, *supra* note 17, at 283–84; *Pharmaceutical Patents, supra* note 49.

⁹⁴ *See, e.g.,* Long, *supra* note 44, at 44–45; Wiggins, *supra* note 17, at 285–86; *supra* notes 1, 37.

⁹⁵ *E.g., America Invents Act: Hearing on H.R. 1249 Before the Subcomm. on Intellectual Prop., Competition, & the Internet*, 112th Cong. (2011) (statement of Mark Chandler, Senior Vice President, General Counsel, and Secretary, CISCO Systems, Inc.), http://judiciary.house.gov/_files/hearings/printers/112th/112-35_65487.PDF.

⁹⁶ *E.g., id.* (statement of Steven W. Miller, Vice President and General Counsel for Intellectual Property, Proctor & Gamble Co.).

⁹⁷ *See supra* note 17; *see also* Zach Carter, *The Spoilsmen: How Congress Corrupted Patent Reform*, HUFFINGTON POST (Oct. 4, 2011, 6:12 AM), <http://www.huffingtonpost>

There are several reasons driving these industries into different camps regarding patent reform. Whereas in the pharmaceutical industry, drugs take over a decade to develop⁹⁸ and are used for a long period of time,⁹⁹ in the software industry, change happens incrementally and on a much faster scale.¹⁰⁰ Additionally, it is much cheaper to copy a drug than to initially develop it.¹⁰¹ This makes patent protection critical in the pharmaceutical industry, but much less so for software. Moreover, in software, direct copying usually does not occur; rather, an infringer independently comes up with the same innovation.¹⁰² Indeed, so far from direct copying, the first notice an alleged infringer has of infringement is often the initiation of a lawsuit, especially with regard to NPEs. And while it is much cheaper to copy a drug than to develop it initially, the same is not true, at least to the same degree, for software patents. Because software patents do not disclose the computer code necessary to implement their claims, nor the many choices and tradeoffs involved in actual software development—even copying a software patent may not be significantly cheaper than designing around that patent.

Additionally, being first to market, having experience with the product, and the power of a brand, all provide strong benefits to an innovator, especially in such a quickly changing field as software.¹⁰³ Indeed, the software industry thrived for many years before software patents really came onto the scene. Bessen and Meurer note that “[e]conomists have long understood that the patent system works substantially better in the chemical and pharmaceutical industries than in most other industries.”¹⁰⁴ There are also cultural reasons why patents are not as critical in software. Early on much software innovation happened in the open, with developers

.com/2011/08/04/patent-reform-congress_n_906278.html (“The bill doesn’t fix the tech system, nor does it take steps to resolve the conflict between tech and pharma. It’s not obvious, for instance, why the same intellectual property rules for drugs have to apply to software.”).

⁹⁸ See *Pharmaceutical Patents*, *supra* note 49.

⁹⁹ See *id.* at 12–14.

¹⁰⁰ See *supra* note 17.

¹⁰¹ See, e.g., Posner, *Competition and Creativity*, *supra* note 3.

¹⁰² Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1424 (2009) (“Copying seems to be the exception, not the rule in patent cases.”); Mark A. Lemley, *Should Patent Infringement Require Proof of Copying?*, 105 MICH. L. REV. 1525, 1526 (2007) (“In the information technology industries, it sometimes seems as though the overwhelming majority of patent suits are not brought against people who copied a technology, but against those who developed it independently.”).

¹⁰³ See, e.g., Posner, *Competition and Creativity*, *supra* note 3.

¹⁰⁴ BESSEN & MEUER, *supra* note 66, at 152.

freely sharing their work with each other.¹⁰⁵ To some extent, this model still exists within the open-source development community. Companies such as RedHat, for instance, base their business model around the support that they provide, rather than on proprietary software.¹⁰⁶ Even Google's successful Android operating system is open-source and available to the public.¹⁰⁷ Given the largely defensive role that patents play for technology companies,¹⁰⁸ rather than seeking the protection provided by the patent system, it might better be said that these companies are seeking protection from the patent system.

B. Damages and Incentives—Concerning the Public Purposes of the Patent System

There is a strong incentive to avoid infringement in the patent law. Knowledge or notice of a patent is not a prerequisite to infringement, with a relatively small exception for marking.¹⁰⁹ Willfulness of the infringer is only relevant for damages once infringement has been established.¹¹⁰ This makes patent infringement basically a strict-liability offense, which creates the incentive to proactively avoid infringing behavior. It does not, however, create an incentive for the patentee to actively enforce his rights. Except for a few weak exceptions,¹¹¹ only market conditions act as incentives to actively enforce patent rights. While this balancing might make sense in the ordinary course, when dealing with NPEs, it creates an incentive to lie in wait

¹⁰⁵ See generally Eric Steven Raymond, *The Cathedral and the Bazaar* (2000), <http://www.catb.org/esr/writings/homesteading/cathedral-bazaar/> (describing early open source software development models).

¹⁰⁶ See Jon Brodtkin, *How Red Hat Killed Its Core Product—And Became a Billion-Dollar Business*, ARS TECHNICA (Feb. 29, 2012, 2:00 AM), <http://arstechnica.com/business/2012/02/how-red-hat-killed-its-core-product-and-became-a-billion-dollar-business/>.

¹⁰⁷ ANDROID DEVELOPERS, <http://developer.android.com/about/index.html> (last visited Feb. 24, 2014).

¹⁰⁸ See *supra* notes 31–32.

¹⁰⁹ See *infra* Part III. There is also a minor exception for indirect infringement under § 271(b) or (c), but knowledge of infringement does not affect liability for direct infringement under § 271(a). Additionally, there is some notice requirement for § 271(g). See 35 U.S.C.A. § 287(g) (2014); Process Patents Amendment Act of 1988, Pub. L. No. 100-418, §§ 9001–9007, 102 Stat. 1107, 1563–1567 (1988) (codified as amended at 35 U.S.C. §§ 154, 271, 287 (1988)). But these are minor exceptions and have limited relevance to this Note.

¹¹⁰ See 35 U.S.C.A. § 284; *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (“[T]o establish willful infringement, a patentee must show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent.”).

¹¹¹ Damages only extend back six years, 35 U.S.C. § 286, and the equitable doctrines of laches and estoppel provide some weak incentive to actively enforce patent rights.

for a product to become locked in and profitable. This is especially true for software patents, where notice failure is particularly high.¹¹² Although such behavior may be in the interest of an NPE, it does not serve the public purposes of the patent system.

1. Incentive to Avoid Infringement

In order to avoid infringing an unknown patent, an inventor can conduct a patent clearance search to determine if an existing patent covers his invention.¹¹³ In the pharmaceutical field, for instance, this strategy makes a good deal of sense. Drugs give rise to well-defined claims, the scope of which are fairly determinable.¹¹⁴ Moreover, the huge initial development costs outweigh the much smaller costs of conducting a patent clearance search.¹¹⁵ That is not the case for software patents. The problem of notice failure is particularly acute for software patents, making a patent clearance search hard, costly to conduct, and likely inadequate.¹¹⁶ Particularly troublesome is this likely inadequacy of a search; even where a patent is known beforehand, it will not be uncommon that a reasonable person having ordinary skill in the art would not find infringement *ex ante*, although a court sometimes will *ex post*.¹¹⁷ Moreover, the much smaller development costs¹¹⁸ make the costs of a patent clearance search, which may itself prove inadequate, harder to justify.¹¹⁹ This has led some scholars to conclude that, in many circumstances, patent clearance is “especially fruitless.”¹²⁰

¹¹² See *supra* notes 67–74 and accompanying text.

¹¹³ See, e.g., BESSEN & MEURER, *supra* note 66, at 48–51 (discussing patent clearance); Colleen V. Chien, *Predicting Patent Litigation*, 90 TEX. L. REV. 283, 289–94 (2011) (discussing patent clearance).

¹¹⁴ See, e.g., *supra* notes 75–76 and accompanying text; see also Chien, *supra* note 113, at 290 (“[Patent] clearance is viewed as ‘manageable’ in commercial-biopharmaceutical settings.”).

¹¹⁵ See, e.g., *supra* notes 48–51 and accompanying text.

¹¹⁶ See *supra* notes 67–91 and accompanying text.

¹¹⁷ See, e.g., BESSEN & MEURER, *supra* note 66, at 50 (describing an infringement action between Kodak and Polaroid, in which despite a vigorous clearance search in which an expert had identified the patents-in-suit and concluded that they were either not infringed or invalid, ultimately infringement was found).

¹¹⁸ See *supra* notes 54–60 and accompanying text.

¹¹⁹ See BESSEN & MEURER, *supra* note 66, at 50 (“The costs of sorting through a large number of uncertain property rights is larger than the expected costs incurred when any one patent is asserted against the innovator.”); *id.* at 200 (“[T]he uncertainty about boundaries makes clearance difficult and subjects inventors to the risk of inadvertent infringement.”); see also Mulligan & Lee, *supra* note 87 (“[Clearance] costs are relatively low in pharmaceuticals and other chemical industries. As a consequence, the patent system serves these industries relatively well. In contrast, discovery costs in the software industry are so high that most firms don’t even try to avoid infringement.”).

¹²⁰ See BESSEN & MEURER, *supra* note 66, at 71; see also FED. TRADE COMM’N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH

Although a clearance search is much more justifiable for pharmaceutical innovations than for software innovations, the incentive to avoid infringement is the same. The patent law creates this incentive to avoid infringement by having damages, consisting of at least a “reasonable royalty,” begin to accrue upon any infringing behavior, intent or knowledge notwithstanding—and those damages go back up to six years.¹²¹ Unlike in copyright law, where proof of copying is necessary,¹²² lack of knowledge of the patent provides no defense to infringement. Given the differences between the software and pharmaceutical industries; the problematic nature of software patents, as opposed to pharmaceutical patents, particularly regarding notice failure; and the resulting differences between clearance searches in each industry, it makes little sense to treat these conflicting situations with the same incentives.

It is worth examining why the patent law places such a strong incentive to avoid infringement upon independent inventors. Patent law is unique in intellectual or real property because patentees have the power “to control the use of their idea—even by those who independently develop a technology with no knowledge of the patent or the patentee.”¹²³ Some have questioned whether this extraordinary right of exclusion is necessary to properly encourage innovation.¹²⁴ Defenses of the right usually rest on the ability to fake independent inventorship, the weakening incentive to innovate that anything but strict liability would provide, or that while some industries might not be affected by this other industries which depend upon patent law more critically would be harmed.¹²⁵ Given that the

COMPETITION 135 (2011), <http://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/10307patentreport.pdf> (identifying the “difficulties in sifting through a multitude of patents,” particularly with regard to the information technology sector).

¹²¹ The concept of willful infringement, *see, e.g., In re Seagate Tech., LLC*, 497 F.3d 1360, 1368 (Fed. Cir. 2007), is an additional incentive to avoid infringement. That, however, is of limited importance here, where the focus is on notice failure. A prerequisite to finding willful infringement is knowledge of (or objective recklessness as to) both the patent and its infringement. *Id.* at 1371.

¹²² *Feist Publ’n, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 361 (1991).

¹²³ *See Lemley, supra* note 102, at 1525; *see also Cotropia & Lemley, supra* note 102, at 1424 (“One of the most significant differences between patent law and other areas of intellectual property is that, in patent law, copying is irrelevant to the determination of infringement.”).

¹²⁴ *See Lemley, supra* note 102; Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 MICH. L. REV. 475, 475 (2006) (“This Article argues that independent invention should be a defense, provided the independent inventor creates the invention before receiving actual or constructive notice that someone else already created it.”).

¹²⁵ *See Lemley, supra* note 102, at 1527–32.

software industry relies less on patent protection than other industries;¹²⁶ that the cost of clearance is harder to justify for software patents; and that NPEs usually do not invent anything, but most often acquire patent rights from others, it makes sense to view this strict liability aspect of the patent law more skeptically for software patents asserted by NPEs. Rather than proposing an independent inventor defense, however, this Note instead argues that damages should not begin to accumulate until the alleged infringer receives some notice of infringement.

2. Incentive for NPEs to Lie in Wait

There is an incentive for NPEs to lie in wait for a product to become locked in before bringing an infringement suit.¹²⁷ As a rule, NPEs tend to assert old patents.¹²⁸ This is because, in the current system, liability does not depend on knowledge of infringement.¹²⁹ And, unlike in trademark law, there are only weak incentives to proactively enforce patent rights.¹³⁰ To be sure, there is a six-year limit on damages,¹³¹ and the equitable doctrines of laches and estoppel exist,¹³² but these alone do not counterbalance the incentive to wait for a product to become locked in. The longer a product or a component of a system is in use, the more it can be relied

¹²⁶ See *supra* Part I.A.3.

¹²⁷ See Sannu K. Shrestha, Note, *Trolls or Market-Makers? An Empirical Analysis of Nonpracticing Entities*, 110 COLUM. L. REV. 114, 140 (2010) (describing how an NPE may wait “until a manufacturer [has sunk] investments into developing and marketing a successful product that infringed its patent and then threaten[] the manufacturer with an injunction to obtain high licensing fees.”).

¹²⁸ See, e.g., Jason Rantanen, *Slaying the Troll: Litigation as an Effective Strategy Against Patent Threats*, 23 SANTA CLARA COMPUTER & HIGH TECH. L.J. 159, 165–66 (2006) (“Another characteristic of patent trolls is their acquisition and enforcement of older patents on newer products.”); David G. Barker, *Troll or No Troll? Policing Patent Usage with an Open Post-Grant Review*, 2005 DUKE L. & TECH. REV. 0009, 4 (2005) (“[C]orporate patent trolls purchase patents and do not enforce them *until the relevant industry has grown up around the patent.*” (emphasis added)).

¹²⁹ See *supra* notes 123–24 and accompanying text.

¹³⁰ Compare *Dawn Donut Co. v. Hart’s Food Stores, Inc.*, 267 F.2d 358, 366 (2d Cir. 1959) (stating that federal trademark law “places an affirmative duty upon a licensor of a registered trademark to take reasonable measures to detect and prevent misleading uses of his mark by his licensees or suffer cancellation of his federal registration”), with *infra* notes 131–32 and accompanying text.

¹³¹ See 35 U.S.C. § 286 (2006).

¹³² See *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1028 (Fed. Cir. 1992) (describing the elements of laches and equitable estoppel in patent cases). Note that the six-year statutory limit on damages is distinct from the six-year period that creates a presumption of laches. *Id.*

upon, and therefore, the harder it is to subsequently change. If a patentee knows of infringement early on, bringing an infringement action or beginning licensing negotiations may cause an infringer to seek a design-around. But if the patentee waits until the product has become locked in and profitable, he gets the two-fold benefit of being able to seek increased damages over a longer period of time, and having the product or component of a system being more expensive to replace. That gives the patentee increased leverage during settlement or licensing negotiations. Thus, although the six-year limit on damages does encourage some proactive enforcement of patent rights, there is a much stronger incentive to lie in wait, especially since the years that such a rule exclude are likely to produce less in damages than when a product has become more mature.

There are incentives to sleep on patent rights, but no strong *legal* incentives to proactively enforce patent rights. However, there can be strong *market* incentives to do so. This is true when a patent holder is in direct competition with an infringer. A stark illustration of this principle is the so-called “smartphone wars”—where Apple has pursued a number of Google affiliates in an effort to protect its smartphone market share—which are being waged largely on the patent battlefield.¹³³ Even when there is not direct competition, it may sometimes be in a patentee’s interest to discourage infringement as a means of making a product distinctive. But for NPEs, who do not produce anything and so are not in direct competition and have no brand to protect, these economic incentives to proactively enforce patent rights do not exist.

3. *The Public Benefits from Prompt Patent Enforcement*

The public benefits from having patent rights actively enforced. Most clearly, active enforcement can encourage a potential infringer to design around a patent and thereby provide new innovation to the public.¹³⁴ But active enforcement can also serve to make the scope of the patent clearer, as

¹³³ Matt Levy, *Smartphone Patent Wars: A Lesson for Privateers*, PAT. PROGRESS (June 27, 2013), <http://www.patentprogress.org/2013/06/27/smartphone-patent-wars-a-lesson-for-privateers/>; Agustino Fontevicchia, *Smartphone Wars: Who Wins and Who Loses from the Apple–Samsung Patent Ruling*, FORBES (Aug. 27, 2012, 4:05 PM), <http://www.forbes.com/sites/afontevicchia/2012/08/27/smartphone-wars-who-wins-and-who-loses-from-the-apple-samsung-patent-ruling/>.

¹³⁴ See *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991) (“Designing around patents is, in fact, one of the ways in which the patent system works to the advantage of the public in promoting progress in the useful arts, its constitutional purpose.”); Lindholm, *supra* note 87, at 88 (“Patents indirectly encourage inventors to find multiple solutions to problems.”).

decisions come down clarifying the scope of a patent or finding a patent invalid. This is beneficial to the public because it helps to correct the problems of notice failure. It will tend to make licensing or settlement negotiations more certain and lower transaction costs as a result. And, to the extent that patent scope is made clearer, such enforcement can work to aid in disclosure of the patent claims, which is one of the fundamental purposes involved in the quid pro quo of the patent system.¹³⁵ The economic incentives of the patent system generally depend upon patent claims being publicly available.¹³⁶ Those incentives—*invention, designing around, disclosure, and commercialization*—are therefore strengthened, to the extent that prompt patent enforcement makes otherwise obscure or uncertain patent claims public.

The purpose of the patent system is not to create private fortunes. The system grants certain monopoly rights in exchange for public disclosure of the invention. But the purpose of it is to bring the benefits of innovation and commercialization to the public. That an NPE might stand to gain more by lying in wait is of no consequence, especially where such behavior is contradictory to the public purposes of the patent system. Indeed, where the incentives are so out of order, it creates a strong argument that change is needed to right the system.

C. Requiring Notice of Infringement Before Damages Begin to Accrue

To correct the incentives of the patent system, notice ought to be given to an alleged infringer before damages begin to accrue, at least for software patent claims asserted by NPEs.¹³⁷ This will create an incentive for NPEs to proactively enforce their patent rights and will serve to counterbalance the negative effects previously described. Moreover, because of the problems of notice failure, particularly regarding software patents, it makes sense to put some burden on the patentee to police his rights. Indeed, it is the patentee who is often in a better position to detect infringing

¹³⁵ See, e.g., *Universal Oil Prods. v. Globe Oil & Ref. Co.*, 322 U.S. 471, 484 (1944) (“As a reward for inventions and to encourage their disclosure, the United States offers a seventeen-year monopoly to an inventor who refrains from keeping his invention a trade secret.”); Rebecca Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1028 (1989) (“The incentive to disclose argument ... rests on the premise that in the absence of patent protection inventors would keep their inventions secret in order to prevent competitors from exploiting them. Secrecy prevents the public from gaining the full benefit of new knowledge and leads to wasteful duplicative research.”).

¹³⁶ See Lindholm, *supra* note 87, at 110.

¹³⁷ See *infra* Part IV (explaining what such a notice requirement might look like).

behavior than parties, who are not familiar with the patent or are uncertain of its scope.

1. The Case for Requiring Notice

Notice failure in patent law is a serious problem, as this Note has demonstrated. It creates uncertainty and risk for companies trying to create new products. It weakens the economic incentives of the patent system, calling into question the wisdom of giving patent holders exclusionary rights in their patented claims. Requiring notice of infringement before damages begin to accrue corrects some, but not all, of these problems. Notice after the fact, for instance, cannot correct the uncertainty of patent scope, or mitigate all the risk that companies face due to that uncertainty, prior to developing a new product. Although it has the effect of limiting damages, companies may still face the threat of an injunction. The possibility of an injunction might be an incentive for a patent holder to lie in wait, instead of actively enforcing his patent rights. However, following *eBay v. MercExchange*, the likelihood of an NPE obtaining an injunction is considerably reduced.¹³⁸

Although requiring notice before allowing damages to begin to accrue may not fix all the problems of notice failure, it can significantly ameliorate them. Principally, requiring notice will encourage NPEs to bring suit earlier than they otherwise would. This is because most of the advantages of waiting for product lock-in are gone—damages will only be forward looking, which will also decrease the overall cost of seeking a design around or license, and the threat of an injunction is small. This will also encourage NPEs to be more careful about the suits they bring because NPEs will face smaller overall damage awards or settlements as a result of litigation, causing litigation costs to consume more of their operating expenses. Prompt enforcement of patent rights, which a notice requirement would encourage, also benefits the public purposes of the patent system.

2. The Case for Targeting Software Patents

Having a notice requirement before damages begin to accrue is meant to correct the problems of notice failure in the patent law. This notice failure is most critical for software patents.¹³⁹ Clearance searches for such patents are often “especially fruitless”—expensive, uncertain, and unlikely

¹³⁸ See *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 394 (2006).

¹³⁹ See *supra* notes 67–91 and accompanying text.

to ward off any risk of future litigation.¹⁴⁰ Moreover, the technological industry relies less on patent protection than other industries, particularly the pharmaceutical industry.¹⁴¹ Given that problems with notice are heightened for software patents, and that the patent system provides less support to the technological industry, it makes sense to specifically target software patents. After all, as already described, software patents are different from other types of patents.¹⁴²

3. *The Case for Targeting NPEs*

As this Note has explained, there is a particular worry about NPEs sleeping on their rights, lying in wait for a product to become locked in before bringing an infringement action.¹⁴³ The notice requirement this Note proposes, therefore, specifically targets NPEs. As explained, the market incentives that exist for companies that produce a product to enforce their rights do not influence NPEs. Additionally, NPEs are generally free from any marking requirements that other companies face.¹⁴⁴ This only compounds the problems of notice failure. NPEs are also known to read their claims more broadly than other patentees.¹⁴⁵ This results in significantly lower findings of infringement and also increases the tendency for notice failure. There is, therefore, a good reason for targeting NPEs over other types of entities.

II. RATIONALE OF PATENT MARKING AND WHY ITS PUBLIC-NOTICE FEATURE SHOULD BE EXTENDED TO COVER NPEs ASSERTING SOFTWARE PATENTS

The marking statute requires that patentees, who market and sell their patented products, mark their products in a manner that makes the patent rights conspicuous to the public.¹⁴⁶ Where marking is feasible and is not done, damages do not begin to accrue until the patentee provides actual notice of infringement.¹⁴⁷ Indeed, the public notice function of the marking statute is deemed so important that the patentee must provide actual notice even where the infringer is already aware of the patent and its

¹⁴⁰ See *supra* notes 117–20 and accompanying text.

¹⁴¹ See *supra* notes 92–108 and accompanying text.

¹⁴² See *supra* Part I.A.

¹⁴³ See *supra* notes 127–33 and accompanying text.

¹⁴⁴ See *infra* Part II.

¹⁴⁵ Cf. Risch, *supra* note 22, at 484 (noting that NPEs assert overly broad claim constructions resulting in a low rate of actual infringement being found).

¹⁴⁶ See 35 U.S.C.A. § 287(a) (West 2014).

¹⁴⁷ *Id.*

infringement.¹⁴⁸ Moreover, where the patentee marks a product with an inapplicable patent or invalidated patent, he may be subject to penalties for false marking.¹⁴⁹

A. Why Marking?

Marking serves an important notice feature of patent law by helping to avoid innocent infringement, encouraging public notice, and identifying products as patented.¹⁵⁰ The marking requirement protects an innocent infringer who might see an unmarked product for sale and assume its design is public.¹⁵¹ Thus, although patents are themselves publicly available, patent law requires that products be marked rather than rely on a purported notice from publicly available patent applications. This requirement to mark is important, both because the bounds of a patent are uncertain and because performing a clearance search can be costly and inadequate, especially for software patents. By requiring actual notice before damages begin to accrue, the marking statute highlights the importance of the disclosure incentive of the patent system.

B. Marking and Software Patents

The applicability of the marking requirement to software patents is not entirely clear, but it is clear that it does not apply in many common situations. In order for the marking statute to apply, there must be a tangible article.¹⁵² Additionally, the marking statute does not apply to pure method

¹⁴⁸ See Jessica S. Siegel, Note, *The Patent Marking & Notice Statute: Invitation to Infringe or Protection for the Unwary?*, 36 HOUS. L. REV. 583, 602–03 (1999) (stating that an infringer’s independent knowledge of the patent does not affect the patentee’s duty to notify where marking is not done).

¹⁴⁹ 35 U.S.C.A. § 292. The AIA restricted standing on this to persons who have “suffered a competitive injury,” but false marking remains an important aspect of the public-notice requirement of marking. *Id.* § 292(b).

¹⁵⁰ *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443 (Fed. Cir. 1998) (stating that the Marking Statute serves three purposes, namely: (1) “helping to avoid innocent infringement”; (2) “encouraging patentees to give notice to the public that the article is patented”; and (3) “aiding the public to identify whether an article is patented” (citations omitted)).

¹⁵¹ See John LaBarre & Xavier Gómez-Velasco, *Ready, Set, Mark Your Patented Software!*, 12 RICH. J.L. & TECH. 3, 27 (2005) (“It is protection against innocent infringement which is exactly what the Marking Requirement is supposed to cure.”); Siegel, *supra* note 148, at 585–87 (“[A] fundamental rationale supporting section 287 [is] supplying notice in order to prevent innocent infringement.” (quoting *Motorola, Inc. v. United States*, 729 F.2d 765, 772 (Fed. Cir. 1984))).

¹⁵² See LaBarre & Gómez-Velasco, *supra* note 151, at 13.

patents,¹⁵³ or mixed method-apparatus patents where only methods are asserted.¹⁵⁴ These two thresholds to applying the marking statute raise an interesting question of what to make of software patents.¹⁵⁵ Because software patents are sometimes pure method patents, because sometimes they are mixed method-apparatus patents where only method claims are asserted, and because there is not always an obvious tangible component to mark,¹⁵⁶ the applicability of the marking requirement to software is murky. Additionally, change happens at a fast pace in software: consider a patented algorithm in an update to a device driver for a particular brand of a wireless keyboard, automatically downloaded from the internet. The lack of the applicability of the marking statute, or, where it may arguably be applicable, its uncertain status, further contributes to notice failure for software patent claims. Of course, where there is no product to mark, as is the case for software patents asserted by NPEs, there is no marking requirement.

C. Extending the Public-Notice Feature of Patent Marking

The Federal Circuit identified three primary purposes of the marking statute: (1) avoiding innocent infringement; (2) encouraging public notice; and (3) aiding the public in identifying a patented article.¹⁵⁷ Given the already observed problem of notice failure regarding software patents in particular, and especially with respect to NPEs, which have limited incentives to proactively enforce their rights as well as no product to mark, it makes at least as good sense to extend the public notice feature of patent marking to software patents asserted by NPEs. Doing so will help to avoid innocent infringement, since once an infringer is made aware of his activity, he will have the opportunity to switch to non-infringing activity, license with the patentee, or contest either that his activity infringes or the validity of the patent. Doing so will also help to encourage public notice; the alleged infringer *must* be given notice before damages can accrue, but other companies or individual inventors engaging in similar activity would also benefit from the required notice. Moreover, because of the acute problems of notice

¹⁵³ *Id.*

¹⁵⁴ See Eugene Goryunov & Mark Polyakov, *To Mark or Not to Mark: Application of the Patent Marking Statute to Websites and the Internet*, 14 RICH. J.L. & TECH. 2, 11 (2007).

¹⁵⁵ See generally Goryunov & Polyakov, *supra* note 154; LaBarre & Gómez-Velasco, *supra* note 151; Lindholm, *supra* note 87.

¹⁵⁶ Consider, for instance, a patented algorithm used to balance server load being used in e-commerce transactions, with all the software loaded on third-party computer systems, and as a component of a much larger system. Or a patented communication protocol, constantly being sent around the world through an interconnected network of third-party computers.

¹⁵⁷ See *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443 (Fed. Cir. 1998).

failure, the rationale of protecting the “innocent infringer” applies with at least as strong a force here as it does in the marking statute.

III. WHAT A NOTICE REQUIREMENT WOULD LOOK LIKE

The requirement that damages do not begin to accrue until actual notice is provided for software patents asserted by NPEs is relatively straightforward to implement. The key issues to settle are what constitutes a software patent, what constitutes an NPE, and what constitutes actual notice. Although there is by no means unanimous agreement on what any of these terms ought to mean, there has been much discussion of them in the literature, and, on the last term, actual notice, there is some guidance from the courts. All this is not to say that choosing particular definitions might not be contentious, but certainly some judicially enforceable choices exist.

A. *Limit to Software Patents*

The requirement that notice of infringement be given before damages begin to accrue should be limited to software patents. As demonstrated above, software patents are distinct from other types of patents, and in particular, the pharmaceutical industry and the software industry have very different sets of needs.¹⁵⁸ The notion of treating different things differently is hardly novel and has also been proposed in other areas of intellectual property, such as in copyright law.¹⁵⁹ David Drummond, Google’s Chief Legal Officer, has said, “I think what we need to do to is move past the one-size-fits-all and start thinking about software patents more specifically.”¹⁶⁰ The idea of software-specific rules has also found some support in the academy.¹⁶¹

Practically, there may be some dispute about what constitutes a software patent,¹⁶² but for most purposes it should be a straightforward matter to decide. There is, at the very least, a sharp divide between software patents

¹⁵⁸ See *supra* Part II.A.

¹⁵⁹ See, e.g., WILLIAM PATRY, *HOW TO FIX COPYRIGHT* (2011).

¹⁶⁰ Evan Ramstad, *Google Chief: Patent Legal Reform a Balancing Act*, WALL ST. J. DIGITS BLOG (Oct. 9, 2012, 6:21 AM), <http://blogs.wsj.com/digits/2012/10/09/google-legal-chief-patent-reform-a-balancing-act>.

¹⁶¹ See, e.g., Ashley Chuang, *Fixing the Failures of Software Patent Protection: Deterring Patent Trolling by Applying Industry-Specific Patentability Standards*, 16 S. CAL. INTERDISC. L.J. 215, 245–50 (2006) (arguing for software-specific standards); Long, *supra* note 44, at 47–48.

¹⁶² See, e.g., James Bessen & Robert M. Hunt, *An Empirical Look at Software Patents* 8–9 (Research on Innovation, Working Paper No. 03-17/R, 2004), <http://www.researchoninnovation.org/swpat.pdf>; Bronwyn H. Hall & Megan MacGarvie, *The Private Value of Software Patents* 13–17 (Nat’l Bureau of Econ. Research, Working Paper No. 12195, 2006), <http://www.nber.org/papers/w12195.pdf>.

on the one hand, and pharmaceutical patents on the other, such that a rule tailored to software patents is not likely to seriously affect pharmaceutical patents. Moreover, judges are expected to decide complex issues of claim construction, to consider nuanced arguments over the doctrine of equivalents, and to make fine distinctions over what constitutes patentable subject matter. That there may be some fuzziness on the edges of what constitutes a software patent hardly makes it a problem that judges cannot be expected to solve.

Congressmen Defazio and Chaffetz defined the term in recent legislation that they have proposed:

The term ‘software patent’ means a patent that covers—
 ‘(A) any process that could be implemented in a computer regardless of whether a computer is specifically mentioned in the patent; or
 ‘(B) any computer system that is programmed to perform a process described in subparagraph (A).’¹⁶³

This definition seems reasonable enough, and would not be too judicially taxing to enforce.

B. Defining Notice—Carryover from the Marking Statute

The notice requirement can be borrowed from the jurisprudence on the marking statute, which requires “actual notice.”¹⁶⁴ Courts have required the allegation of infringement of specific patents by specific products.¹⁶⁵ It is not enough to aver to a large patent portfolio, or to make vague suggestions of infringement. Because the purpose behind this notice requirement and the marking statute are similar, and because the proposed notice requirement is in some sense an extension of the marking statute, it is logical to adopt a similar concept of actual notice.

However, the two situations do differ in at least one important respect. It is not as necessary here to keep a requirement of actual notice where the infringer knows of the patent and knows his activity infringes that patent. The marking statute does require actual notice even where the accused infringer already has knowledge of the patent and the likelihood of infringement, and it does so, in part, because marking provides notice to the general public and should be encouraged.¹⁶⁶ Here, however, the notice is meant primarily for the accused infringer, so it does not make as much sense to require actual notice where the accused infringer already has knowledge of the patent and the likelihood of infringement. Such a rule would, to be sure,

¹⁶³ H.R. 6245, 112th Cong. § 2(a) (2012).

¹⁶⁴ See *supra* Part III.

¹⁶⁵ *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1345 (Fed. Cir. 2001).

¹⁶⁶ See *supra* Part II.

save judicial time, as it is a clear rule to apply. There would be no need for a contentious proceeding where the patentee goes to every effort to show the accused infringer's knowledge of infringing behavior. But this judicial economy must be weighed against the potential safe harbor such a rule would give to willful infringers, as opposed to the "innocent infringers" the rule is designed to protect. Weighing these concerns, it does not appear that a rule requiring actual notice by the patentee, even where the infringer is aware both of the patent's existence and of his infringement of the patent, best serves the public purposes of the patent system.

C. Defining Non-Practicing Entities

While patent trolls, or NPEs, are widely discussed in the literature, there are a number of different ways of defining the term. There are even a number of different terms being used, such as Patent Assertion Entities or Patent Monetization Companies. Some observers would include universities, others not. Some would include small, independent inventors, others not. Some would include formerly productive companies that have turned to litigation only after collapse, others not. In short, there are a number of choices in who exactly would be subject to the requirement.¹⁶⁷ Ultimately, fine distinctions about who is or is not an NPE will not be terribly significant. Universities account for a vanishingly small percentage of patentees bringing infringement actions; the bulk of infringement actions brought by entities that might conceivably fit under the term NPE are brought by patent holding companies or other corporations formed for the express purpose of patent litigation, that is, the quintessential patent troll.¹⁶⁸

Congressmen Defazio and Chaffetz defined, in recent legislation they proposed to Congress, a non-practicing entity in terms of any entity that does not fit under one of these conditions:

(1) ORIGINAL INVENTOR.—Such party is the inventor, a joint inventor, or in the case of a patent filed by and awarded to an assignee of the original inventor or joint inventor, the original assignee of the patent.

(2) EXPLOITATION OF THE PATENT.—Such party can provide documentation to the court of substantial investment made by such party in the exploitation of the patent through production or sale of an item covered by the patent.

(3) UNIVERSITY OR TECHNOLOGY TRANSFER ORGANIZATION.—Such party is—

(A) an institution of higher education (as that term is defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001); or

¹⁶⁷ See Sara Jeruss et al., *The America Invents Act 500: Effects of Patent Monetization Entities on US Litigation*, 11 DUKE L. & TECH. REV. 357, 366–72 (2012) (describing terms used to identify NPEs and problems with whom to include in that category).

¹⁶⁸ See *id.* at 376.

(B) a technology transfer organization whose primary purpose is to facilitate the commercialization of technology developed by one or more institutions of higher education.¹⁶⁹

This definition seems reasonable. While there may be corner cases or objections as to particular entities, the worst of the non-practicing entities or patent assertion entities or patent trolls—call them what you will—can be defined without including individual inventors or universities.

CONCLUSION

There is a general consensus that the current patent system is not optimal. For some, it can be crippling. It hinders innovation, creates risks and uncertainties, and encourages counterproductive behavior. Much of this can be traced to the problems of notice failure, which is particularly acute for software patents asserted by NPEs. Where patent rights are uncertain and their scope impossible to determine *ex ante*, there will necessarily be some entities seeking to profit from this state of affairs. Knowing the high stakes involved and the expense of even successfully defending an infringement action, even innocent parties are tempted to settle. Only the biggest of companies, willing to take a hard stand to make a point, can afford to defend themselves against repeated infringement claims. The situation demands reform.

The reform advocated by this Note, that damages do not accrue until actual notice is provided to an infringer when a software patent is asserted by an NPE, helps soften some of the more egregious effects of the current system. In particular, while helping technology companies against the overbearing threat of patent trolls, the proposal will keep in place the strong patent protections that other industries, in particular the pharmaceutical and biotechnology industries, depend upon. The tonic is a targeted one, designed to help the system where it is most damaged, but leave in place what is functioning properly. As such, despite the traditional antagonism between technology companies on the one hand, and pharmaceutical and biotechnology companies on the other, those industries need not work against each other with respect to the reform this Note proposes.

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¹⁶⁹ H.R. 845, 113th Cong. § 2(a) (2013).

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