Software Patents and/or Software Development*

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INTRODUCTION

Many contemporary treatments of the patent system begin with Fritz Machlup's damning with faint praise:

> If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it.[1]

Yet he concludes that for all its imperfections, the patent system is still worth keeping.[2] Patent may introduce costs and inefficiencies, this analysis goes, but since patents serve a necessary function in creating incentives to innovate, we must bear and mitigate their costs. The time is ripe to revisit that analysis.

In the case of software patents, I challenge the incentive side of the equation: Patents do not provide a useful incentive to innovate in the software industry, I contend, because the patent promise ill-suits the engineering and development practices and business strategies of software production. The problem is not merely an inefficiency in implementation of software patent, but a structural mismatch between where the

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[1] SUBCOMM. ON PATENTS, TRADEMARKS, & COPYRIGHTS OF THE S. COMM. ON THE JUDICIARY, 85TH CONG., AN ECONOMIC REVIEW OF THE PATENT SYSTEM 80 (Comm. Print 1958), [hereinafter S. SUBCOMM., ECONOMIC REVIEW].

[2] *Id.*

incentive applies and how software innovation happens. Even an ideally implemented software patent—well examined, fully disclosed and enabling, and properly scoped in light of the prior art—would fail to serve the incentive functions intended by the Constitution, the Patent Act, and standard patent theory.

Previous scholarship, whether critical or congratulatory of software patent, has largely failed to examine the structure of software development and the institutional specifics of patent's operation in this industry. I therefore look at these mechanics: How is the incentive function of patent believed to operate? How does it operate in the software industry? Does the tool serve its goals? Addressed head on, even before compounding the issue with side effects and unintended consequences, I conclude that the answer to this last question is "no." Present knowledge and experience now offer sufficient evidence that patents disserve software innovation.

Part I situates the problem by providing an account of the tangle of patent lawsuits, licenses, and threats in the mobile phone industry.

Part II describes the nature of software development, its sources of innovation, and its business environment. This part draws on sources from engineering, computer science, and business and strategy literature, as well as the experiences of commercial and open source software developers. I discuss several ways in which software development differs from the canonical model of manufacturing widgets as well as the challenges of going from idea to implementation, including prototyping, revising to meet user needs, and debugging. With the aim of identifying common frameworks, this part focuses on the nuts and bolts of how systems function, a feature shared with New Institutional Economics literature. While market dynamics differ among segments, we can identify commonalities derived from the underlying nature of software.

Part III reviews existing legal theories of patent incentives and innovation. It formalizes the mismatch between incentive theory and software patent practice. In many of the accounts that attribute value to software patents, a circularity exists: startups claim that patents are important because investors demand them, whereas venture capitalists, who view patents as a signal of capacity or uniqueness, are in fact seeing a show aimed at attracting investment rather than a demonstration of genuine novelty or value to the customer market. Kitch's prospect theory does no better to validate

software patents. The patent claim is staked too early to give the proprietor a useful coordinating or notice function.

Part IV applies the theories about patent incentives and innovation to software more specifically. Where do software developers and venture capital backers seek patents, and how do individuals and firms use them? Looking particularly at the timing of patent's intervention in the system, I conclude that it encourages idea-claiming, not innovation; idea-generation, but not implementation, debugging, and deployment. A player focused on patenting can obtain numerous patents without developing any of the technologies to useful levels of deployment or disclosure, leaving a minefield of abstract patent claims for others who actually deploy software. Hence, the "troll" problem is particularly acute in the software field. Because generating a patentable idea for an initial invention rarely creates a bottleneck in the software development process, software patents that never reach implementation more frequently create entangling thickets than productive incentives. Here, I also analyze the patent alternatives that are available to protect software development: trade secrecy, copyright, first-mover advantage, and market complements.

Part V uses this analysis to reflect on the institutional dynamics of patent law. In particular, close analysis of software patents and software development adds to the ongoing debate over technology—specificity versus uniformity in law and the proper role of courts versus Congress in deciding patent questions. This analysis will also assist in better framing the question of how best to uphold the constitutional mandate to "promote the progress of science and useful arts."[3]

I. THE MOBILE PHONE MESS

A. Smartphone Patent Wars

Smartphones are everywhere. As the hottest selling consumer product category in consumer electronics history, smartphones have provoked moral panics (are we losing ourselves behind screens, neglecting interpersonal communication? are kids "sexting"?); safety risks (don't text and drive); and development optimism (in developing countries, where more people have cell phones than landlines, the phone is becoming the basis for mobile commerce and access to computing power).

[3] U.S. CONST. art. I, § 8, cl. 8.

These devices have been at the heart of the last few years' most ferocious patent storms.[4] Throughout 2012, in the United States alone, dozens of patent litigations focused directly or indirectly on mobile phone technology.[5] Some of those suits relate to hardware features but more frequently concern the smartphone's software capabilities.[6] For example, Lodsys, a Marshall, Texas corporation, has no known products, but the company offers patented technologies "available for licensing"[7] and has sued or threatened to sue dozens of application software companies alleging that in-app purchases and rating functions utilize Lodsys proprietary technology.[8] Although Lodsys claims that Apple, Google, and Microsoft have patent licenses covering their own "nameplate" products,[9] it argues that those do not extend

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[4] *See, e.g.*, Apple, Inc. v. Samsung Electronics Co., 11-cv-1846 (N.D. Cal. 2012); Apple Inc. v. Motorola Mobility, No. 11-cv-178 (W.D. Wisc. 2012); Microsoft Corp. v. Motorola, Inc., No. C10-1823 (W.D. Wash. 2012); In the Matter of Mobile Electronic Devices, including Wireless Communication Devices, Portable Music and Data Processing Devices, and Tablet Computer, 2012 WL 4077563 (U.S. Int'l Trade Comm'n).

[5] *See generally* Fred I. Williams & Rehan M. Safiullah, *The Smartphone Patent Wars: A U.S. Perspective*, 18 IP LITIGATOR, July/Aug. 2012, *available at* http://cdn.akingump.com/images/content/5/5/v2/5506/IPLIT070812WilliamsSafiullah.pdf.

[6] *See generally id.* As the case of software-defined radio demonstrates, the lines between hardware and software are changing. *See, e.g.*, articles discussed in *Software Defined Radio*, ARRL.ORG, http://www.arrl.org/software-defined-radio (last visited Mar. 22, 2013); *see also* Stephen M. Blust, *Software Based Radio*, *in* SOFTWARE DEFINED RADIO: ENABLING TECHNOLOGIES 5 (Walter H.W. Tuttlebee, ed. (2002)) (describing a "shift from employing a traditional hardware-focused application-specific approach to radio implementation to using a software application to perform the radio tasks on a computing platform").

[7] *Licensing*, LODSYS GROUP LLC, http://www.lodsys.com/licensing.html (last visited Oct. 2, 2012).

[8] Eric Mack, *Mobile Patent Wars: A Closer Look at How Everyone Loses*, PC WORLD (Nov. 6, 2011, 9:00 PM), http://www.pcworld.com/article/239873/mobile_patent_wars_a_closer_look_at_how_everyone_loses.html.

[9] *See Q: Lodsys Is Trying to Force Apple to Take a License by Pressuring IOS Developers*, LODSYS GROUP LLC (May 15, 2011), http://www.lodsys.com/1/post/2011/05/q-lodsys-is-trying-to-force-apple-to-take-a-license-by-pressuring-ios-developers.html; *Q: What About Other Operating Systems such as Android?*, LODSYS GROUP LLC (May 15, 2011), http://www.lodsys.com/1/post/2011/05/q-what-about-other-operating-systems-such-as-android.html.

to third-party developers.[10] Apple has moved to intervene,[11] and Google has called for reexamination of the patents.[12]

Patents are clearly costly.[13] Their drafting and prosecution take time and money that could be spent on product development. Litigation costs start at nearly half a million dollars before a case even gets to trial.[14] Damages in the event of a loss can run to millions of dollars.[15] Further, companies are now making acquisitions with a primary aim to obtain patents. A coalition including Apple, Microsoft, and Research In Motion paid $4.5 billion to acquire Nortel's patent portfolio in the company's bankruptcy auction in July 2011.[16] These patents amounted to $700,000 apiece for their coalition of purchasers—who, given that the sale included no going concern, acquired only the use of the patents but none of the know-how or experience of the inventors. When Google announced its agreement a few weeks later to acquire Motorola Mobility Inc. for $12.5 billion, the acquisition of a major mobile hardware manufacturer was widely read as a purchase of a defensive portfolio of mobile software patents as a means to

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[10] *Apple's License Claim Disputed*, LODSYS GROUP LLC (May 31, 2011), http://www.lodsys.com/1/post/2011/05/-apples-license-claim-disputed.html; *see also* Sarah Perez, *Patent Holding Firm Lodsys Goes After Android Developer for Use of In-App Payments*, READWRITEWEB (May 27, 2011), http://www.nytimes.com/external/readwriteweb/2011/05/27/27readwriteweb-patent-holding-firm-lodsys-goes-after-andro-98683.html.

[11] Apple Inc.'s Motion to Intervene, Lodsys, LLC v. Combay, Inc. et al., 11-cv-272, (E.D. Tex. June 9, 2011 *available at* http://www.scribd.com/doc/57508610/0-Apple-Motion-to-Intervene-Against-Lodsys.

[12] *See Google Steps Up to Defend Android Developers from Patent Lawsuit*, WIRED.COM (Aug. 13, 2011, 2:20 AM), http://www.wired.com/gadgetlab/2011/08/google-android-lodsys-patent.

[13] *See generally* JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 39-42 (2008). "Innovators can benefit from patents and at the same time be burdened with dispute costs that exceed the value of those benefits." *Id.* at 96.

[14] STEVEN M. AUVIL & DAVID A. DIVINE, AM. INTELLECTUAL PROP. LAW ASS'N, REPORT OF THE ECONOMIC SURVEY 2011, at 35 (2011).

[15] A recent PWC study found that annual median damages awards ranged from $2.4M to $10.5M. *See* CHRIS BARRY ET AL., THE CONTINUED EVOLUTION OF PATENT DAMAGES LAW (PriceWaterhouseCoopers ed., 2010).

[16] *See* Chris V. Nicholson, *Apple and Microsoft Beat Google for Nortel Patents*, N.Y. TIMES DEALBOOK (July 1, 2011, 4:58 AM), http://dealbook.nytimes.com/2011/07/01/apple-and-microsoft-beat-google-for-nortel-patents/ (last updated July 1, 2011, 8:31 PM). Similarly, in 2011, another consortium consisting of Microsoft, Oracle, Apple, and EMC spent $450 million for 882 patents owned by Novell. *See CPTN Holdings LLC and Novell Inc. Change Deal in Order to Address Department of Justice's Open Source Concerns*, DEP'T OF JUSTICE (Apr. 20, 2011), http://www.justice.gov/opa/pr/2011/April/11-at-491.html; Press Release, Novell Completes Merger with Attachmate and Patent Sale to CPTN Holdings LLC, Novell (Apr. 27, 2011), http://www.novell.com/news/press/2011/4/novell-completes-merger-with-attachmate-and-patent-sale-to-cptn-holdings-llc.html.

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