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APPLE VS. ANDROID: GLOBAL SOFTWARE PATENTABILITY AND THE MOBILE OS WARS

INTRODUCTION

On Friday, August 24, 2012, a jury in San Jose, California awarded Apple, Inc. (“Apple”) a jury verdict exceeding one billion dollars in its patent infringement suit against Samsung Electronics Company (“Samsung”).¹ The verdict was the third-largest jury award ever seen in U.S. patent litigation.² The impact of the trial reverberated well beyond the immediate damages award; the Monday following the verdict, Samsung’s stock price dropped by 7.5%, representing a loss of approximately twelve billion dollars in market value.³ The technology press closely followed the trial and dubbed it the “Patent Trial of the Century.”⁴ The outsize verdict echoed throughout the industry and in the future may encourage timidity in smartphone design choices by Apple’s competitors in an industry that has

1. Nick Wingfield, *Jury Awards \$1 Billion to Apple in Samsung Patent Case*, N.Y. TIMES (Aug. 24, 2012), <http://www.nytimes.com/2012/08/25/technology/jury-reaches-decision-in-apple-samsung-patent-trial.html>. After a retrial on damages ordered by Judge Lucy Koh, Apple’s total liability stands at \$929.8 million. Gerry Shih, *U.S. Jury Awards Apple \$290 Million in Retrial Against Samsung*, REUTERS (Nov. 21, 2013), <http://www.reuters.com/article/2013/11/21/us-apple-samsung-verdict-idUSBRE9AK19V20131121>. This verdict is still subject to adjustment by Judge Koh. Florian Mueller, *Retrial Jury Awards Apple \$290 Million, Total Damages in Case Against Samsung: \$929 Million*, FOSS PATENTS (Nov. 21, 2013), <http://www.fosspatents.com/2013/11/retrial-jury-awards-apple-290-million.html>.

2. Cromwell Schubarth, *Apple’s \$1B Patent Win Is Third Biggest in U.S.*, SILICON VALLEY BUS. J. (Aug. 25, 2012, 9:27 AM PDT), <http://www.bizjournals.com/sanjose/news/2012/08/25/apples-1b-patent-win-is-third.html>.

3. Miyoung Kim, *Samsung Shares Drop \$12 Billion after Apple’s Court Victory*, REUTERS (Aug. 27, 2012), <http://www.reuters.com/article/2012/08/27/us-samsung-shares-idUSBRE87Q00120120827>.

4. See, e.g., Philip Elmer-DeWitt, *Apple v. Samsung: The Patent Trial of the Century Starts Today*, FORTUNE (July 30, 2012), <http://tech.fortune.cnn.com/2012/07/30/apple-v-samsung-the-patent-trial-of-the-century-starts-today>.

coalesced around similar styles.⁵ While the sheer size of the verdict has captured the attention of the media, the San Jose trial represents just one of Apple's plays in an elaborate, global litigation strategy including over fifty lawsuits spanning across ten countries.⁶

The patent dispute between Apple and Samsung has rightly been viewed as one battle in a larger proxy war between Apple and another industry giant, Google.⁷ The two companies are jockeying for control over the mobile operating system ("OS") industry, and their respective mobile operating systems, iOS and Android,⁸ are currently the top two mobile operating sys-

5. Brian X. Chen & Lisa Alcalay Klug, *A Verdict That Alters an Industry*, N.Y. TIMES (Aug. 24, 2012), <http://www.nytimes.com/2012/08/25/technology/a-verdict-that-alters-an-industry.html>.

6. In addition to the United States, Apple has sued Samsung in Germany, the United Kingdom, France, Italy, the Netherlands, Spain, South Korea, Japan, and Australia. Florian Mueller, *List of 50+ Apple-Samsung Lawsuits in 10 Countries*, FOSS PATENTS (Apr. 28, 2012), <http://www.fosspatents.com/2012/04/list-of-50-apple-samsung-lawsuits-in-10.html>. Apple has also been involved in patent litigation against Motorola over Motorola's use of the Android operating system in multiple United States District Courts, the International Trade Commission ("ITC"), and in Germany. Florian Mueller, *Updated Lists of Android Patent Infringement Findings and Successful Countersuits*, FOSS PATENTS (Oct. 12, 2012), <http://www.fosspatents.com/2012/10/updated-lists-of-android-patent.html>. Additionally, Apple and smartphone manufacturer HTC were engaged in litigation in both the ITC and the U.K. Chloe Albanesius, *HTC Secures Patent Win Against Apple in U.K.*, PC MAG (July 5, 2012, 11:43 AM), <http://www.pcmag.com/article2/0,2817,2406730,00.asp>. Apple and HTC have since settled all of their patent disputes pursuant to a ten-year licensing agreement. Ian Sherr, *Apple, HTC Settle Patent Dispute, Sign Licensing Pact*, WALL ST. J. (Nov. 11, 2012), <http://online.wsj.com/article/SB10001424127887324894104578111792346747174.html>.

7. Alexei Orekovic & Poornima Gupta, *Exclusive: Google, Apple CEOs in Secret Patent Talks*, REUTERS (Aug. 30, 2012), <http://www.reuters.com/article/2012/08/30/us-google-apple-idUSBRE87T15H20120830>.

8. Many consumers frequently confuse the Android software with the computing devices that utilize it. Android is an operating system developed by Google that is then licensed to manufacturers like Samsung. Marziah Karch, *What Is Google Android?*, ABOUT.COM, http://google.about.com/od/socialtoolsfromgoogle/p/android_what_is.htm (last visited Jan. 20, 2013).

tems by a large margin.⁹ iOS and Android currently enjoy respective market shares of 14.9% and 75%, while the next most successful competitor, BlackBerry, controls only 4.3% of the market.¹⁰ Apple's co-founder, Steve Jobs, famously told his biographer Walter Isaacson that he viewed Android as a "stolen product" and vowed to wage a "thermonuclear war" against Google for its release.¹¹ However, rather than attacking Google directly, Apple has elected to sue companies that use Android in products that currently compete with Apple's iPhone and iPad.¹² Apple has yet to sue Google itself, instead targeting a number of consumer electronics manufacturers that sell devices running Android, including Samsung, HTC Corp. ("HTC"), and Motorola.¹³ Some commentators speculate that this is because Google distributes Android free of cost under an open-source license, and therefore does not directly profit from Android, making damages much more difficult for Apple to prove.¹⁴ Nonetheless, a series of courtroom victories against manufacturers that use Android may encourage Apple to target Google, because some of Apple's patent claims implicate features that are found in the core Android operating system.¹⁵

9. Jessica E. Vascellaro & Amir Efrati, *Google, Apple Tighten Grip on Smartphone Market*, WALL ST. J. (June 18, 2012), <http://online.wsj.com/article/SB10001424052702303379204577474794114369320.html>. Combined, iOS and Android lead the next competitor, BlackBerry, by over 85% of the total market share. Dara Kerr, *Android Beats iOS 5-to-1 in Q3 Smartphone Market Share*, CNET (Nov. 1, 2012), http://news.cnet.com/8301-1035_3-57544131-94/android-beats-ios-5-to-1-in-q3-smartphone-market-share.

10. Kerr, *supra* note 9.

11. Connie Guglielmo, *Apple Analysts Call Verdict an Important Victory in 'Thermonuclear War' with Google Android*, FORBES (Aug. 27, 2012, 1:59 PM), <http://www.forbes.com/sites/connieguglielmo/2012/08/27/apple-analysts-call-verdict-an-important-victory-in-thermonuclear-war-with-google-android/>.

12. Claire Cain Miller & Brian X. Chen, *Samsung Case Puts Apple Closer to Google Fight*, N.Y. TIMES (Aug. 28, 2012), <http://www.nytimes.com/2012/08/28/technology/samsung-case-puts-apple-closer-to-fight-with-google.html>.

13. Philip Elmer-DeWitt, *Will Apple Now Sue Google?*, FORTUNE (Aug. 25, 2012, 7:58 PM EDT), <http://tech.fortune.cnn.com/2012/08/25/will-apple-now-sue-google>.

14. Miller & Chen, *supra* note 12.

15. Most of Apple's infringement claims against Samsung arose from its TouchWiz "skin," a software modification that changes the appearance of the operating system. Ryan Whitwam, *How the Apple-Samsung Case Could Push OEMs Closer to Google and Stock Android*, EXTREME TECH (Aug. 28, 2012,

This patent dispute comes at a time when many in the technology industry are becoming skeptical about the usefulness of software patents in fostering innovation.¹⁶ One of the more vocal critics is U.S. Circuit Judge Richard Posner.¹⁷ Judge Posner elected to preside over the *Apple v. Motorola* litigation in the Northern District of Illinois in the summer of 2012.¹⁸ Despite finding that the patents were valid and infringed, Judge Posner cancelled the jury trial and dismissed the case because, in his opinion, neither party could prove damages nor “establish a right to relief.”¹⁹ In an interview, Judge Posner questioned whether patents are necessary in the software industry—without patents, innovative software companies would still receive the benefit of being first to market.²⁰ He also expressed

10:01 AM), <http://www.extremetech.com/computing/135108-how-the-apple-samsung-case-could-push-oems-closer-to-google-and-stock-android>. However, some of Apple’s patents, including the patent for distinguishing between single and multiple finger touches on a touchscreen, are built into the stock version of Android developed by Google. These features could eventually lead to patent claims by Apple against Google itself. Miller & Chen, *supra* note 12.

16. Michael J. Miller, *Software Patents Mean More Litigation, Less Innovation*, PC MAG (Aug. 28, 2012, 5:13 PM EST), <http://forwardthinking.pcmag.com/none/302064-software-patents-mean-more-litigation-less-innovation>.

17. Michael Hiltzik, *Blame a Dysfunctional Patent System for the Apple vs. Samsung Verdict*, L.A. TIMES (Aug. 28, 2012), <http://articles.latimes.com/2012/aug/28/business/la-fi-hiltzik-20120828>.

18. Dan Levine, *Judge Who Shelved Apple Trial Says Patent System out of Sync*, REUTERS (Jul. 5, 2012), <http://www.reuters.com/article/2012/07/05/us-apple-google-judge-idUSBRE8640IQ20120705>.

19. Order of June 7, 2012 at 1, *Apple Inc. v. Motorola, Inc.*, No. 1:11-cv-08540 (N.D. Ill. June 7, 2012).

20. Levine, *supra* note 18. Being the “first-mover” is generally considered to confer a competitive advantage on the first company to market a type of product or enter a certain market. See *First Mover*, INVESTOPEDIA, <http://www.investopedia.com/terms/f/firstmover.asp> (last visited Nov. 17, 2013). Some question whether software patents are necessary in light of how quickly software markets develop, arguing that the first-mover advantage is sufficient incentive to encourage innovation. See Brian J. Love, *No: Software Patents Don’t Spur Innovation, but Impede It*, WALL ST. J. (May 12, 2013), <http://online.wsj.com/news/articles/SB10001424127887323335404578444683887043510> (arguing that new market entrants in the software field focus on innovation rather than obtaining patent protection for their ideas). Under this view, software patents impose high costs on innovation because they are typically obtained by incumbent firms rather than new market entrants and enormous amounts of money that could be spent on research in development is instead spent on obtaining and litigating patents. *Id.*

concern that companies are using software patents to stifle competition.²¹ It is common industry practice to acquire massive patent portfolios in order to defend against litigation, almost a legal version of the mutually assured destruction paradigm seen during the Cold War.²² Indeed, Google stated that it purchased Motorola Mobility merely to acquire Motorola's impressive portfolio of approximately 17,000 patents.²³ The iOS and Android patent dispute therefore serves as a useful case study for the effects on a global industry when a powerful player decides to aggressively litigate its patents and seek an injunction in courts rather than negotiating a licensing agreement.²⁴

One common thread connecting the lawsuits in the global Apple-Android legal battle is the Agreement on Trade Related Aspects of Intellectual Property Rights ("TRIPs Agreement" or "TRIPs").²⁵ Signed in 1994, the TRIPs Agreement attempted to harmonize global intellectual property ("IP") law by requiring a minimum level of IP protection of its signatory countries.²⁶ The

21. Levine, *supra* note 18.

22. Just as superpowers obtained massive stockpiles of nuclear weapons during the Cold War to deter against nuclear attack, today technology companies hoard software patents as a strategy to deter high-stakes patent lawsuits. See Alex Blumberg & Laura Sydell, *When Patents Attack*, NPR (Jul. 26, 2011, 8:04 PM), <http://www.npr.org/blogs/money/2011/07/26/138576167/when-patents-attack>.

23. Jacob Goldstein, *Google Escalates the Patent Arms Race*, NPR (Aug. 15, 2011, 12:08 PM), <http://www.npr.org/blogs/money/2011/08/15/139639032/google-escalates-patent-arms-race>.

24. Although Apple has offered a licensing arrangement to Samsung, Boris Teskler, Director of Patent Licensing Strategy at Apple, testified at trial that Apple is not interested in licensing certain patents relating to iOS's user interface ("UI") to Samsung. See Megan Geuss, *Apple v. Samsung: Apple Says It Has No Interest in Licensing Its Patents*, ARS TECHNICA (Aug. 10, 2012, 9:05 PM EDT), <http://arstechnica.com/apple/2012/08/apple-v-samsung-apple-has-no-interest-in-licensing-its-patents>.

25. TRIPs is central to the Apple-Android patent dispute because it articulated a global standard for what types of inventions are patentable. See Agreement on Trade-Related Aspects of Intellectual Property Rights art. 27, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 [hereinafter TRIPs Agreement].

26. Adam Isaac Hason, *Domestic Implementation of International Obligations: The Quest for World Patent Harmonization*, 25 B.C. INT'L & COMP. L. REV. 373, 376 (2002).

TRIPs Agreement applies to all members of the World Trade Organization ("WTO").²⁷ The two forum countries discussed in this paper, the United States and the United Kingdom, are both members of the WTO and are therefore signatories to the TRIPs Agreement.²⁸ Since the WTO has 159 member countries, TRIPs has an extremely broad base.²⁹ Given such wide adherence, TRIPs is an excellent starting point for discussing potential changes to international patent law.

Several aspects of the TRIPs Agreement are relevant to software patents. First, some groups contest whether TRIPs even requires patent protection for software in the first place.³⁰ Second, TRIPs requires signatory countries to issue patents for a minimum of twenty years, and the twenty-year term applies regardless of subject matter or technological field.³¹ Third, TRIPs mandates that its signatory countries offer injunctive relief as a remedy for patent infringement.³² Given the rapid rise and fleeting market life of consumer electronics globally, the TRIPs Agreement should be updated to reduce the minimum patent period for software applications from twenty years to five years, and provide for a specific definition under Article 27 of what constitutes an "inventive step . . . capable of industrial application,"³³ which would streamline international pa-

27. Kelvin W. Willoughby, *How Much Does Technology Really Matter in Patent Law? A Comparative Analysis of Doctrines of Appropriate Patentable Subject Matter in American and European Patent Law*, 18 FED. CIR. B.J. 63, 77 (2008).

28. *Understanding the WTO: The Organization—Members and Observers*, WORLD TRADE ORG. (Mar. 2, 2013), http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm.

29. *Id.*

30. Article 10 of the TRIPs Agreement states that software is to be afforded protection under the Berne Convention, which provides for copyright protection. See TRIPs Agreement, *supra* note 25, art. 10. Additionally, TRIPs does not specifically require patents in any particular field, but rather "inventions . . . in all fields of technology." *Id.* art. 27.

31. *Id.* art. 27.

32. *Id.* art. 29.

33. Under the TRIPs Agreement, an invention must be "new, involve an inventive step and [be] capable of industrial application" in order to be patentable. *Id.* art. 27. These requirements have led to uncertainty and generated differing views on what types of software are patentable under the treaty. See Charles R. McManis, *Taking TRIPs on the Information Superhighway: International Intellectual Property Protection and Emerging Computer Technology*, 41 VILL. L. REV. 207, 247–48 (1996).

tent litigation, reduce litigation costs for both patent holders and patent-issuing countries, and reduce industry reliance on high-volume but low-quality patent portfolios as a primary patent strategy.³⁴

Part I of this paper will provide background on the significance of the Apple-Android patent dispute, as well as an overview of two recent cases, *Apple Inc. v. Samsung Electronics Co.* in the United States, and *HTC Europe Co. LTD v. Apple Inc.* in the United Kingdom. Part II will discuss how TRIPs has impacted patent law globally and provide an overview of software patentability in the United States and the U.K. Part III will analyze how TRIPs fails to provide guidance on software patentability by analyzing the results of the *Apple Inc. v. Samsung Electronics Co. LTD* and *HTC v. Apple Inc.* cases. Finally, Part IV will discuss potential modifications to the TRIPs Agreement that would provide for increased competition in the fields of software and consumer electronics.

I. BACKGROUND

The Apple-Android patent dispute comes as the computing industry is shifting from desktops and laptops to mobile devices, providing an opportunity for companies to cement themselves as key players in an emerging market.³⁵ This section will discuss the significance of the patent disputes in light of these changes, and provide an overview of how the dispute is playing out in U.S. and U.K. courts.

A. The Significance of the Apple-Android Patent Dispute

The ultimate outcome of this global patent battle will have a profound effect on the landscape of mobile computing for years to come.³⁶ Shipments of new smartphones have surpassed shipments of new personal computers.³⁷ Apple capitalized on

34. See Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 42 (2005).

35. Claire Cain Miller, *In Mobile World, Tech Giants Scramble to Get Up to Speed*, N.Y. TIMES (Oct. 22, 2012), <http://www.nytimes.com/2012/10/23/technology/in-mobile-world-tech-giants-struggle-to-get-up-to-speed.html>.

36. Chen & Klug, *supra* note 5.

37. Chloe Albanesius, *Smartphone Shipments Surpass PCs for First Time. What's Next?*, PC MAGAZINE (Feb. 8, 2011, 12:53 PM), <http://www.pcmag.com/article2/0,2817,2379665,00.asp>. This trend is particu-

this trend with its iPhone and iPad, the prolific sales of which vaulted Apple to the position of the wealthiest company in the world by market capitalization, overtaking even the oil giant Exxon-Mobil.³⁸ Whoever ultimately wins the battle for mobile operating system market share will reap both huge profits and tremendous control over the fastest-growing sector in computing.³⁹

To understand the tremendous implications of this patent dispute, one need not look further than the operating system war that Apple and Microsoft waged during the 1980s and 1990s.⁴⁰ The results of this battle are clear: approximately 90% of the world's personal computers currently run some version of Windows.⁴¹ The two companies took very different approaches to computing, with Apple designing both hardware and software as one package, and Microsoft designing software to license to its hardware partners.⁴² In this sense, iOS is very much like the original Macintosh ("Mac"), a closed system designed top to bottom by Apple, while Android resembles Windows as a platform that can be licensed for use on an array of

larly true in developing countries, where low-cost mobile devices have become the primary means of accessing the Internet for over 50% of smartphone users. *New Internet Audience Emerges in Developing Countries*, ON DEVICE RESEARCH (Mar. 15, 2011, 10:05), <http://ondeviceresearch.com/blog/new-internet-audience-emerges-in—developing-countries>. This is partially due to the fact that the lower price of smartphones provides a lower barrier to entry to Internet access. See *Mobile Devices on the Rise: Their Impact on our Lives and on Networks*, ITU NEWS (Apr. 2011), <https://itunews.itu.int/en/533-Mobile-devices-on-the-rise.note.aspx>.

38. Adam Satariano, *Apple Overtakes Exxon Becoming World's Most Valuable Company*, BLOOMBERG (Aug. 10, 2011), <http://www.bloomberg.com/news/2011-08-09/apple-rises-from-near-bankruptcy-to-become-most-valuable-company.html>.

39. See Peter Burrows, *Apple vs. Google*, BLOOMBERG BUSINESSWEEK (Jan. 14, 2010), http://www.businessweek.com/magazine/content/10_04/b4164028483414.htm.

40. See Daniel Eran Dilger, *iPhone Patent Wars: Apple's \$1.1 Billion ARM Injection Ignites a Mobile Patent Race*, APPLE INSIDER (Aug. 12, 2013), <http://appleinsider.com/articles/13/08/12/iphone-patent-wars-apples-11-billion-arm-injection-ignites-a-mobile-patent-race>.

41. *Desktop Operating System Market Share*, NETMARKETSHARE, <http://www.netmarketshare.com/operating-system-market-share.aspx?qprid=10&qpcustomd=0> (last visited Oct. 6, 2013).

42. Scott Martin et al., *Microsoft Unveils Surface Tablets*, USA TODAY (Jun. 18, 2012), <http://www.usatoday.com/tech/news/story/2012-06-18/microsoft-surface-tablet/55676790/1>.

different hardware. Steve Jobs was furious when he discovered that after Bill Gates visited Apple's campus, Microsoft intended to design an operating system with a graphical user interface that would compete with the Mac,⁴³ an idea that Apple allegedly took from Xerox.⁴⁴ Apple is surely mindful of another operating system war, as Android's market share skyrocketed shortly after its release.⁴⁵ As Android trends toward similar dominance, reminiscent of Windows, a large patent award could benefit Apple through licensing fees or an outright injunction.⁴⁶ Even if Apple cannot attain injunctions in this round of lawsuits, Apple could demand licensing fees from manufacturers using the "free" Android operating system,⁴⁷ eating into their profits and making Android a less attractive option compared to other alternatives.⁴⁸

43. Lee Moran, *Revealed: The Dinner with a Microsoft Employee That Irritated Steve Jobs So Much He Created the iPad*, DAILY MAIL (Oct. 25, 2011), <http://www.dailymail.co.uk/news/article-2053242/Steve-Jobs-iPad-idea-originated-dinner-Microsoft-employee-irritated-him.html>.

44. Lawrence M. Fisher, *COMPANY NEWS; Xerox Sues Apple Computer over Macintosh Copyright*, N.Y. TIMES (Dec. 15, 1989), <http://www.nytimes.com/1989/12/15/business/company-news-xerox-sues-apple-computer-over-macintosh-copyright.html>.

45. *Google Android Phone Shipments Increase by 886%*, BBC NEWS (Aug. 2, 2010), <http://www.bbc.com/news/technology-10839034>.

46. Charles Arthur, *Apple to Seek Injunction Against Samsung Smartphones and Tablets*, GUARDIAN (Aug. 25, 2012), <http://www.guardian.co.uk/technology/2012/aug/25/apple-samsung-injunction-fine>.

47. Although Google currently licenses Android for free, Microsoft has assessed substantial licensing fees against several manufacturers. Over 50% of Android phones are subject to such agreements with Microsoft. It is estimated that the manufacturer HTC pays Microsoft a royalty of \$5 per smartphone that uses Android. Thus, while Google does not charge for using Android, using it is not "free," and additional license fees to Apple would only increase its cost relative to other alternatives. See Jon Brodtkin, *Microsoft Collects License Fees on 50% of Android Devices, Tells Google to "Wake up"*, ARS TECHNICA (Oct. 23, 2011, 5:30 PM), <http://arstechnica.com/information-technology/2011/10/microsoft-collects-license-fees-on-50-of-android-devices-tells-google-to-wake-up>.

48. Apple has demanded licensing fees of up to \$30 per device from Samsung, which could dramatically raise the licensing fees associated with Android. Samsung has thus far refused Apple's offer. See Florian Mueller, *What Apple's 2010 \$30-per-unit Licensing Proposal to Samsung Means for Android in 2012 and Beyond*, FOSS PATENTS (Aug. 11, 2012, 5:01 PM), <http://www.fosspatents.com/2012/08/what-apples-2010-30-per-unit-licensing.html>. HTC has entered into a ten-year licensing agreement with

B. Analyzing Apple's Global Patent Lawsuits Through the TRIPs Agreement in the United States and the United Kingdom

One of the primary treaties addressing substantive patent law is the TRIPs Agreement, signed in 1994.⁴⁹ A primary goal of the TRIPs Agreement was to address the growing issue of international intellectual property violations due to a lack of international patent enforcement.⁵⁰ In order to address these issues, the TRIPs Agreement sought to establish a baseline of protection for patents, copyright, and trademark by requiring its signatory countries to implement a minimum level of IP protection via statute.⁵¹ Some of the provisions implemented to achieve this goal are a requirement for the patentability of inventions regardless of the field of technology, a twenty-year minimum patent period, and the ability to enforce patent rights through the issuance of an injunction.⁵² The TRIPs Agreement therefore harmonized international patent law by requiring its signatories to adopt a minimum level of patent protection.⁵³ However, some major outliers persist; the TRIPs Agreement is binding on individual member states of the European Union, but it is not binding on the European Patent Office, which issues patents covering all EU member states.⁵⁴ This lack of uniformity is best observed in a global patent war such as the recent Apple-Android patent dispute, where courts in different signatory countries have enforced similar patents in radically different ways.⁵⁵

Apple, although the license fee has not been disclosed to the public. *Samsung Files Redacted Copy of Apple-HTC Deal in U.S. Court*, REUTERS (Dec. 6, 2012), <http://www.reuters.com/article/2012/12/06/us-apple-samsung-idUSBRE8B505Y20121206>. A judge has ordered Apple to disclose the terms of the agreement to Samsung. *Id.*

49. Hason, *supra* note 26, at 374.

50. *Id.*

51. *Id.* at 376.

52. *Id.* at 377-78.

53. *Id.* at 386-87.

54. *Id.* at 386.

55. As discussed *infra* in Part III, one of Apple's U.S. patents was found to be valid at trial, contributing to the one billion dollar jury verdict, while a similar European patent was found to be invalid in the U.K. as excluded subject matter.

1. The United States: A Record Jury Award for Apple

As mentioned above, the *Apple v. Samsung* trial in California granted Apple one of the largest patent victories ever seen in U.S. litigation.⁵⁶ While a modern smartphone implicates potentially hundreds of thousands of patents,⁵⁷ Apple asserted only seven against Samsung.⁵⁸ Apple alleged that a total of twenty-eight Samsung devices infringed upon these patents.⁵⁹ Of primary importance was U.S. Patent No. 7,844,915 (“the ‘915 patent”), which describes “application programming interfaces for scrolling operations”⁶⁰ and covers software that can distinguish between single-touch scrolling input and multi-touch pinch-to-zoom input.⁶¹ The jury found that twenty-one Samsung devices infringed upon the ‘915 patent.⁶² In total, the jury awarded Apple over one billion dollars for Samsung’s infringements.⁶³ Further, the jury found that Samsung willfully infringed upon six of Apple’s patents, which could have exposed Samsung to treble damages.⁶⁴ While the damages awarded were reduced following a retrial, Samsung remains liable for almost one billion dollars,

56. Wingfield, *supra* note 1.

57. *The Android Patent War: An Apple Trade Claim Could Bar Imports of Its Competitors*, WALL ST. J. (Dec. 5, 2011), <http://online.wsj.com/article/SB10001424052970204826704577074523539966352.html>.

58. Kent German, *Apple v. Samsung: The Infringing Device Scorecard*, CNET NEWS (Aug. 24, 2012, 7:00 PM), http://news.cnet.com/8301-13579_3-57500273-37/apple-v-samsung-the-infringing-device-scorecard.

59. Chris Gaylord, *Apple vs. Samsung: Who Owns Smart Phones?*, CHRISTIAN SCI. MONITOR (Sept. 13, 2012), <http://www.csmonitor.com/Innovation/Tech/2012/0913/Apple-vs.-Samsung-Who-owns-smart-phones>.

60. U.S. Patent No. 7,844,915 (filed Jan. 7, 2007).

61. German, *supra* note 58.

62. Amended Verdict Form at 3, *Apple, Inc. v. Samsung Electronics Co.*, No. 11-CV-01846-LHK (N.D. Cal. Aug. 24, 2012) [hereinafter Verdict Form].

63. Wingfield, *supra* note 1.

64. Lance Whitney, *Apple Wants \$3B in Damages from Samsung, Says Report*, CNET NEWS (Sept. 19, 2012), [http://news.cnet.com/8301-13579_3-57515675-37/apple-wants-\\$3b-in-damages-from-samsung-says-report](http://news.cnet.com/8301-13579_3-57515675-37/apple-wants-$3b-in-damages-from-samsung-says-report). Judge Koh eventually rejected the jury’s finding of willful infringement and denied Apple treble damages. Florian Mueller, *Judge, Unlike Jury, Finds Samsung’s Infringement of Apple’s Patents Was not Willful*, FOSS PATENTS (Jan. 30, 2013), <http://www.fosspatents.com/2013/01/judge-overrules-jury-finds-samsungs.html>.

and Apple has a renewed opportunity to seek a permanent injunction against infringing Samsung products.⁶⁵

2. *HTC v. Apple* in the U.K.: Defeat for Software Patents “As Such”

In addition to its international legal battle against Samsung, Apple has also been involved in litigation internationally with other manufacturers that use Android, including Taiwan-based HTC Corp.⁶⁶ HTC's suit against Apple in the U.K. provides an important counterpoint to *Apple v. Samsung* in the United States because it implicates similar patents.⁶⁷ HTC filed suit against Apple in the U.K. on July 29, 2011,⁶⁸ in two separate actions to invalidate three of Apple's European patents.⁶⁹ When Apple then sued HTC under a fourth patent, HTC counter-claimed to have that patent invalidated.⁷⁰ The first patent the court considered, European Patent No. 2098948, enables “recognizing single and multiple point and touch events in multi-point and multi-touch enabled devices.”⁷¹ The court found that HTC's devices did not infringe this patent, and further that the patent was invalid as excluded subject matter.⁷² The second patent, European Patent No. 1964022, describes “unlocking a device by performing gestures on an unlock image.”⁷³ Apple's

65. Mueller, *supra* note 1.

66. Aleksi Tzatzev, *Apple's New iPhone Could Put It at the Center of a “Thermonuclear” Patent War*, BUS. INSIDER (Sept. 13, 2012, 6:10 PM), <http://www.businessinsider.com/global-apple-litigation-2012-9>.

67. *See HTC Defeats Apple in Swipe-to-Unlock Patent Dispute*, BBC NEWS (July 4, 2012), <http://www.bbc.co.uk/news/technology-18709232>.

68. Florian Mueller, *Apple's Dispute with HTC Goes Global: HTC Files Lawsuit in the UK*, FOSS PATENTS (Aug. 1, 2011, 8:21 PM), <http://www.fosspatents.com/2011/08/apples-dispute-with-htc-goes-global-htc.html>.

69. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [1].

70. *Id.*

71. European Patent No. 2098948 (filed Apr. 3, 2009).

72. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [363]. “Excluded subject matter” refers to things that are not considered to be inventions and are therefore excluded from patentability by statute. Avi Freeman, *Patentable Subject Matter: The View from Europe*, INT'L FREE & OPEN SOURCE L. REV., Sept. 2011, at 59, 60.

73. European Patent No. 1964022 (filed Nov. 30, 2006). The High Court opinion incorrectly states the patent number as 2964022. *See* Florian Mueller, *UK High Court Clears HTC of Infringement of Four Apple Patents—*

claims on this patent were found to be invalid for obviousness, although the patent was not found to be invalid as excluded subject matter.⁷⁴ The third patent, European Patent No. 2059868, covers a user interface design for scrolling through photographs on small screens.⁷⁵ The court found that HTC's devices did not infringe upon this patent, though it was not invalidated as excluded subject matter.⁷⁶ The final patent, European Patent No. 1168859, involved the use of a multilingual keyboard.⁷⁷ This patent was found to be invalid as obvious in light of prior art, but was not found to be excluded subject matter.⁷⁸ The results of *HTC v. Apple* stand in stark contrast to the results of *Apple v. Samsung* in the United States, as HTC was cleared of all infringement allegations and three out of the four patents that Apple asserted against HTC were found to be invalid.⁷⁹

II. THE PATENTABILITY OF SOFTWARE INTERNATIONALLY

As the primary treaty addressing subject matter patentability, TRIPs has the potential to exert great influence on the legal standards that nations apply to software patents. This section will provide an overview of how TRIPs has influenced substantive patent law internationally, as well as the applicable legal standards that have developed in the United States and the U.K.

A. The Impact of the TRIPs Agreement on Substantive Patent Law Globally

The TRIPs Agreement represented a significant change in international patent law by requiring signatory countries to

Business as Usual, FOSS PATENTS (July 4, 2012, 7:03 PM), <http://www.fosspatents.com/2012/07/uk-high-court-clears-htc-of.html>.

74. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [363].

75. European Patent No. 2059868 (filed Aug. 30, 2007).

76. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [363].

77. Mueller, *supra* note 73.

78. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [363].

79. Aaron Souppouris, *UK High Court Rules Three Apple Patents Invalid, Vindicates HTC*, VERGE (July 4, 2012, 11:45 AM), <http://www.theverge.com/2012/7/4/3136922/apple-htc-uk-high-court-patents-invalid>.

adopt its requirements into domestic patent law.⁸⁰ Previous patent law treaties, such as the Patent Cooperation Treaty ("PCT"), only enacted procedural changes such as global patent applications.⁸¹ TRIPs went one step further by requiring signatory countries to adopt a minimum global standard for IP protection implemented in domestic law.⁸² The domestic implementation requirement has caused some to describe TRIPs as "the most ambitious intellectual property convention ever attempted," as it is difficult to persuade countries to implement changes to domestic law in order to protect foreign intellectual property interests.⁸³ This global standard was in some respects even stricter than the domestic requirements of countries that already had robust patent protection, and therefore represented a tightening of global patent protection.⁸⁴ However, the agreement was signed in 1994, while the software and mobile devices industries were in relative infancy.

While TRIPs has laid substantial groundwork for global patent harmonization, several of its provisions are quite ambiguous and have led to interpretation issues. For example, it is not clear that TRIPs even requires patent protection for software, and this question has been the subject of some debate.⁸⁵ Article 10 of the TRIPs Agreement provides that "[c]omputer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971)."⁸⁶ Some ad-

80. Michael L. Doane, *TRIPs and Intellectual Property Protection in an Age of Advancing Technology*, 9 AM. U.J. INT'L L. & POL'Y 465, 468 (1994).

81. Jay A. Erstling et al., *Usefulness Varies by Country: The Utility Requirement of Patent Law in the United States, Europe and Canada*, 3 CYBARIS INTELL. PROP. L. REV. 1, 20 (2012).

82. Aaron D. Charfoos, *How Far Have We Come, and Where Do We Go from Here: The Status of Global Computer Software Protection under the TRIPs Agreement*, 22 NW. J. INT'L L. & BUS. 261, 268 (2002).

83. Hasson, *supra* note 26, at 374.

84. Prior to the TRIPs Agreement, the patent term in the United States was seventeen years after the date of grant. In the U.K., the term was sixteen years after the date of filing, and in Germany, it was eighteen years from the date of filing. By extending the term of patent protection to twenty years, TRIPs increased the term of patent protection in all three countries. See Michael Guntersdorfer, *Software Patent Law: The United States and Europe Compared*, 2003 DUKE L. & TECH. REV. 6, 29 (2003).

85. See Charfoos, *supra* note 82, at 263 (discussing the failure of TRIPs to address whether software is patentable subject matter *per se* as a weakness in the treaty).

86. TRIPs Agreement, *supra* note 25, art. 10.

vocates of more modest software patent protection have used this provision to argue that the TRIPs Agreement intended to protect software under copyright, but not with patent protection.⁸⁷ Article 27 of the TRIPs Agreement, however, provides that “patents shall be available for any inventions, whether products or processes in all fields of technology.”⁸⁸ Proponents of strong patent protection argue that this provision mandates that software receive patent protection as a “field of technology.”⁸⁹ Some scholars argue that these two provisions are in fact compatible, as patents provide stronger protection than copyright, and the two systems therefore complement one another.⁹⁰

The ambiguity of whether software patents are required under TRIPs can be seen in disparities in patent law in individual signatory countries. U.S. courts have held for quite some time, even prior to the TRIPs Agreement, that software is patentable subject matter.⁹¹ In Europe, however, the European Patent Convention (“EPC”) explicitly excludes computer programs “as such” from patentable subject matter.⁹² Although the European Patent Office (“EPO”) is not a signatory to the TRIPs Agreement, and therefore is not bound by its terms,⁹³ each individual

87. *The TRIPs Treaty and Software Patents: A Copyrightable Field of Technology?*, FOUND. FOR A FREE INFO. INFRASTRUCTURE (Apr. 5, 2010), <http://eupat.ffii.org/stidi/trips>.

88. TRIPs Agreement, *supra* note 25, art. 27.

89. See Willoughby, *supra* note 27, at 79 (2008) (citing evidence that the technology requirement of Article 27 was demanded by WTO member states seeking a broad scope of patentable subject matter).

90. Judith A. Szepesi, *Maximizing Protection for Computer Software*, 12 SANTA CLARA COMPUTER & HIGH TECH. L.J. 173, 194 (1996).

91. See *Diamond v. Diehr*, 450 U.S. 175, 187–88 (1981) (holding that an invention, viewed as a whole, is patentable even if the only novel element is a mathematical algorithm).

92. Article 52(2)(c) of the European Patent Convention (“EPC”) states that “programs for computers” are excluded from patentable subject matter. However, this is limited by Article 52(3), which states that computer programs are only excluded “to the extent to which a . . . patent relates to such subject matters or activities as such.” Convention on the Grant of European Patents (European Patent Convention) art. 52, Oct. 5, 1973, 1065 U.N.T.S. 199, 13 I.L.M. 276. Software is considered to be a computer program “as such” if it “does not have the potential to cause a ‘further technical effect’ which must go beyond the inherent technical interactions between hardware and software.” *Patents for Software?*, EUROPEAN PATENT OFFICE, <http://www.epo.org/news-issues/issues/computers/software.html> (last updated Aug. 21, 2013). This rather confusing concept will be discussed in greater detail in Part II.C.

93. Hasson, *supra* note 26, at 386.

European member state is a signatory to TRIPs as a WTO member.⁹⁴ Additionally, patents issued by the EPO apply to EU member states, although they are subject to interpretation under each member state's domestic law.⁹⁵ Decisions of the EPO can still influence the substantive law of member states. For example, while U.K. courts are bound to follow their own precedent, EPO decisions are treated as persuasive authority.⁹⁶ Further, achieving consistent results over an individual patent case filed in multiple forums is a compelling objective that may influence the decisions of U.K. courts.⁹⁷ While both the EPO and U.K. courts have recognized that software is patentable in some instances, the view in Europe, and especially the U.K., is more restrictive than both U.S. common law and a literal reading of the TRIPs Agreement.⁹⁸ Ambiguity in this area of Article 27 has therefore failed to clarify the threshold question of whether software is patentable subject matter in the first place, allowing disparate patentability standards to be adopted by signatories.

The patentability of software is not the only area of Article 27 that has generated confusion. Article 27 requires that patents be available in every technological field, "provided that they are new, involve an inventive step, and are capable of industrial application."⁹⁹ While this requirement has analogies in both U.S. and European law, the requirements for subject matter patentability have been subject to intense litigation in both forums.¹⁰⁰ This has caused courts on both sides of the Atlantic to accept and discard a multitude of different tests for patentabil-

94. Susan J. Marsnik & Robert E. Thomas, *Drawing a Line in the Patent Subject-Matter Sands: Does Europe Provide a Solution to the Software and Business Method Patent Problem?*, 34 B.C. INT'L & COMP. L. REV. 227, 268 (2011); *The European Union and the WTO*, WORLD TRADE ORG., http://www.wto.org/english/thewto_e/countries_e/european_communities_e.htm (last visited Oct. 6, 2013).

95. Marsnik & Thomas, *supra* note 94, at 268–69.

96. *Id.* at 303.

97. *Id.* at 316.

98. *See id.* at 320–21 (discussing uncertainty in the patentability of software and business methods in Europe relative to the United States).

99. TRIPs Agreement, *supra* note 25, art. 27.

100. *See generally* Marsnik & Thomas, *supra* note 94 (detailing the development of patent law in the United States and Europe and discussing the development and rejection of a multitude of tests for subject-matter patentability in both forums).

ity within a short period of time.¹⁰¹ The European and U.S. views on the patentability of software have largely converged.¹⁰² However, differences remain, as the United States generally accepts “pure” software patents, while the EPO and the U.K. still find software programs “as such” to be statutorily excluded subject matter, requiring “something more” to be patentable.¹⁰³

B. U.S. Substantive Patent Law after TRIPs

The TRIPs Agreement made several important changes to substantive patent law in the United States. The Uruguay Round Agreements Act (“URAA”) codified TRIPs into U.S. law.¹⁰⁴ The most important change brought about by the implementation of TRIPs in the United States was an extension of the patent term from seventeen years to twenty years.¹⁰⁵ While this marked a significant extension for patent terms, the actual term of a patent filed may be substantially shorter than twenty years, as patents under the URAA are measured from the date of filing rather than the date of issue.¹⁰⁶ The URAA also allows for provisional applications, allowing a priority date that does not count toward the patent term. Furthermore, it allows for the use of foreign activity to show the date of invention.¹⁰⁷ Finally, the URAA expanded the definition of infringement to “offers to sell,” increasing patent protection to include the marketing of infringing products.¹⁰⁸ The URAA thus added

101. *See generally id.*

102. Guntersdorfer, *supra* note 84, at 33.

103. Marsnik & Thomas, *supra* note 94, at 320–21.

104. Karen Tripp & Linda Stokley, *Changes in U.S. Patent Law Effected by the Uruguay Round Agreements Act—The GATT Implementation Legislation*, 3 TEX. INTELL. PROP. L.J. 315, 316 (1995).

105. *Id.* at 316–17.

106. *Id.* It can take over three years for a filed patent to be issued. *Average Patent Application Pendency*, PATENTLYO (Dec. 12, 2011), <http://www.patentlyo.com/patent/2011/12/average-patent-application-pendency.html>.

107. Tripp & Stokley, *supra* note 104, at 319–20 (1995). The use of foreign materials to show the date of invention is now moot, as the America Invents Act shifted the United States from a “first to invent” system to a “first to file” system, bringing U.S. patent filing practices in line with most of the rest of the world. *See* Reena Jain, *America: Last in Line for First-to-File*, COLUM. SCI. & TECH. L. REV. (Apr. 6, 2012), <http://www.stlr.org/2012/04/america-last-in-line-for-first-to-file>.

108. Tripp & Stokley, *supra* note 104, at 321.

modest changes to U.S. patent law, the most significant being an extension of the patent term.¹⁰⁹ The most important changes to U.S. patent law that contrast with European law occurred in the courts—where TRIPs provided precious little guidance.

The U.S. Congress has long avoided addressing the issue of whether software is patentable, leaving the question largely to federal courts.¹¹⁰ The U.S. Supreme Court first considered whether software was patentable subject matter in 1972 in the case *Gottschalk v. Benson*.¹¹¹ The Court rejected the claim due to its excessive breadth.¹¹² However, the Court explicitly stated that its holding did not preclude the patentability of software programs, although it did not answer the question of patentability definitively.¹¹³ This holding left the door open for courts to explore the patentability of software in the future.

The Supreme Court again considered the patentability of software in *Diamond v. Diehr*.¹¹⁴ That case involved a patent claim that described using constant temperature measurements to adjust an algorithm in order to determine the precise time to finish the curing of rubber.¹¹⁵ The majority determined that the invention in *Diehr* was patentable because the application of the algorithm created a more efficient method for curing rubber and created an industrial transformation of the sort that patents were designed to protect.¹¹⁶ Under this test, an invention involving an algorithm or software would be patentable as long as it provided a novel physical transformation, although this was not a requirement for patentability.¹¹⁷ This physical transformation test is similar to the test currently used in the U.K. where “something more” is required for patentability of software.¹¹⁸

In the 1990s, the Supreme Court and the Federal Circuit began to move in the direction of increased patentability for software applications lacking such a physical transformative step.

109. *Id.* at 316.

110. Marsnik & Thomas, *supra* note 94, at 247.

111. *Id.*

112. *Id.* at 247–48.

113. *Gottschalk v. Benson*, 409 U.S. 63, 71 (1972).

114. *Diamond v. Diehr*, 450 U.S. 175, 177 (1981).

115. *Id.* at 178–79.

116. *Id.* at 178, 187.

117. Marsnik & Thomas, *supra* note 94, at 251.

118. This “something more” is an elusive concept in U.K. patent law that generally requires an improvement in a computer’s function. *Id.* at 321.

In *In re Alappat*, the Federal Circuit largely abandoned the Supreme Court's physical transformation test with respect to claims involving software and algorithms.¹¹⁹ The court held that an invention is not excluded from patentability as an "abstract idea" as long as it provides a "useful, concrete, tangible result."¹²⁰ Additionally, inventions could be implemented solely on a computer because "a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."¹²¹

In *State Street Bank v. Signature Financial Group, Inc.*, the Federal Circuit held that mathematical algorithms are patentable subject matter provided that they are "useful," in that they involve a "practical application of an abstract idea."¹²² Soon after, in *AT&T Corp. v. Excel Communications, Inc.*, the Federal Circuit rejected the physical transformation test that the Supreme Court had adopted in *Diehr*.¹²³ The court found that the physical transformation test "seem[ed] of little value" because after *Diehr* and *Alappat*, the mere use of mathematical algorithms did not preclude patentability unless the invention did not provide a "useful, concrete and tangible result."¹²⁴ After these two cases, software no longer received special subject-matter scrutiny, and was patentable if it produced a "useful, concrete, and tangible result."¹²⁵

Following *AT&T* and *State Street*, the Supreme Court backpedaled on the Federal Circuit with respect to patentable subject matter.¹²⁶ In *Bliski v. Kappos*, the Court considered a business method patent that could protect investors against the risk of price changes in the energy market.¹²⁷ In addition to rejecting the Federal Circuit's physical transformation test, the

119. *Id.* at 258.

120. *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994).

121. *Id.* at 1545.

122. *State Street Bank v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

123. Marsnik & Thomas, *supra* note 94, at 260.

124. *AT&T Corp. v. Excel Comm'ns., Inc.*, 172 F.3d 1352, 1359 (Fed. Cir. 1999).

125. Marsnik & Thomas, *supra* note 94, at 260.

126. *See Bliski v. Kappos*, 130 S.Ct. 3218, 1321 (2010) (holding that the "machine-or-transformation" test is not the sole test for patent eligibility under 35 U.S.C. § 101).

127. *Id.* at 3223.

Court ruled that the invention was not patentable because it was an “abstract idea.”¹²⁸ However, the Court declined to define what might make a “process” patentable, instead directing the lower courts to its decisions in *Benson*, *Parker v. Flook*, and *Diehr*.¹²⁹ However, this holding increased ambiguity in the realm of patentable subject matter because the Supreme Court had never actually answered these questions.¹³⁰

While subject matter patentability remains ambiguous after *Bilski*, a few things are certain. First, software and business methods remain patentable subject matter, as the Supreme Court refused the opportunity to categorically exclude them.¹³¹ Second, software does not need to be tied to a particular machine or involve a transformation of matter, as the Court rejected the Federal Circuit’s reasoning that the machine-or-transformation test is the sole test for patentability.¹³² The only restriction that remains is that a software patent cannot be “too abstract.”¹³³ While this ambiguous, undefined standard will likely be a thorn in the side of courts and the United States Patent and Trademark Office (“USPTO”) for some time, it is clear that software remains broadly patentable in the United States.¹³⁴

C. U.K. Substantive Patent Law after TRIPs

A survey of substantive patent law in the U.K. demonstrates that the U.K. treats software patentability quite differently than the United States, as the U.K. tends to take a much

128. *Id.* at 3231.

129. *Id.* In *Parker v. Flook*, the Supreme Court considered a patent on a process that calculated an “alarm limit” that would maintain efficiency or avoid dangerous levels in certain industrial processes. Marsnik & Thomas, *supra* note 94, at 248–49. The only novel process in the invention was a mathematical algorithm, which would by itself be unpatentable. *Id.* at 249. The Court declined to rule on the patentability of software, but instead required patent examiners to remove any algorithm from the claimed invention and determine whether the process as a whole was new and useful. *Id.*

130. Stephen Pulley, *An “Exclusive” Application of an Abstract Idea: Clarification of Patent-Eligible Subject Matter After Bilski v. Kappos*, 2011 B.Y.U. L. REV. 1223, 1224 (2011).

131. *Id.* at 1246.

132. *Id.* at 1245–46.

133. *Id.* at 1247.

134. *Id.* at 1249.

stricter approach to subject matter exclusions.¹³⁵ The Patent Act of 1977 (“U.K. Patent Act”) governs patent law in the U.K.¹³⁶ Subject matter exceptions to the statute are covered by subsections 1(2), 4(A), and 76(A); with subsection 1(2) covering “as such” exclusions of the type used to find one of Apple’s multi-touch patents invalid in the *HTC v. Apple* case.¹³⁷ Subsection 1(2) of the U.K. Patent Act explicitly lists “a program for a computer” as one of the subject matter areas excluded by the statute “as such.”¹³⁸ The U.K. patent statute therefore has more categorical subject matter exclusions and a specific exclusion for computer software compared to patent legislation in the United States.¹³⁹ These subject matter exclusions tend to be judicially created in the United States, as seen above.¹⁴⁰ However, courts in the U.K. tend to construe these restrictions more narrowly in light of the policy behind patents.¹⁴¹

The case of *Shopalotto.com* is an instructive starting point on how courts treat the patentability of software in the U.K. The patent at issue in *Shopalotto* involved “a computer apparatus configured to provide a lottery playable over the [I]nternet.”¹⁴² In that case, Justice Pumfrey provided a general overview of the “technical contribution” requirement that may elevate a patent from a computer program “as such” to patentable software.¹⁴³ According to Justice Pumfrey, “an invention may be viewed as a solution to a concrete technical problem.”¹⁴⁴ However, “[m]erely to program a computer so that it operates in a new way is not a solution to any technical problem It fol-

135. Emir Aly Crowne-Mohammed, *A Review of the ‘As Such’ Exclusions to Patentable Subject Matter in the United Kingdom: Lessons for Canadian and American Courts*, 20 ALB. L.J. SCI. & TECH. 457, 462 (2010).

136. Alexandra K. Pechhold, *The Evolution of the Doctrine of Equivalent in the United States, United Kingdom, and Germany*, 87 J. PAT. & TRADEMARK OFF. SOC’Y 411, 423 (2005).

137. Crowne-Mohammed, *supra* note 135, at 462; *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [99].

138. Patents Act 1977, c. 37, § 1(2)(c) (Eng).

139. Crowne-Mohammed, *supra* note 135, at 462.

140. Jeff Thruston, *Echoes from the Past: How the Federal Circuit Continues to Struggle with Patentable Subject Matter Post-Bilski* *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057 (Fed. Cir. 2011), 77 MO. L. REV. 591, 595 (2012).

141. Crowne-Mohammed, *supra* note 135, at 462.

142. *Shopalotto.com*, [2005] EWHC (Pat) 2416, [1].

143. *Id.* at [11].

144. *Id.*

lows that an inventive contribution cannot reside in excluded subject matter.”¹⁴⁵ Under this test, for a computer program to be patentable it must either produce an effect outside of the computer or solve a technical problem within the computer.¹⁴⁶

Another case, *Fujitsu Ltd.’s Patent Application*, demonstrates an instance where the U.K. courts deemed software unpatentable as a computer program “as such.” In that case, the Court of Appeals of England and Wales considered a patent application for a computer program capable of producing models of crystalline structures in place of plastic models.¹⁴⁷ The court found that the invention was merely an implementation of a mental act through the use of software, and therefore was not patentable subject matter because it lacked a significant enough technical contribution.¹⁴⁸ The court adopted the Examiner’s view of the invention as “simply a conventional computer programmed to display the same images as were previously produced using plastic models,” and therefore the invention “[did] not involve a technical advance of the kind” necessary to constitute patentable subject matter.¹⁴⁹ This reflects that the technical contribution of software must be outside of the program itself and cannot be tied to a mental process.

Finally, in *Aerotel Ltd. v. Telco Holdings Ltd.*, the England and Wales Court of Appeal proposed a four-part test to determine if computer software falls within patentable subject matter.¹⁵⁰ The steps of the test are “1) properly construe the claim; 2) identify the actual contribution; 3) ask whether it falls solely within the excluded subject matter; and 4) check whether the actual or alleged contribution is actually technical in nature.”¹⁵¹ In *AT&T Knowledge Ventures LP*, the court laid out “useful signposts” to help determine whether software contained a “technical effect” of the type envisioned in *Aerotel* that rendered software patentable.¹⁵² The “signposts” ask:

145. *Id.*

146. Crowne-Mohammed, *supra* note 135, at 473–74.

147. In the matter of Application No. 9204959:2 by Fujitsu Limited, [1997] RPC 608, [1997] EWCA (Civ) 1174.

148. *Id.*

149. *Id.*

150. *Aerotel Ltd. v. Telco Holdings Ltd.*, [2006] EWCA (Civ) 1371, [40].

151. *Id.*

152. *AT&T Knowledge Ventures LP*, Re [2009] EWHC (Pat) 343, [40].

1) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer; 2) whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the applications being run; 3) whether the claimed technical effect results in the computer being made to operate in a new way; 4) whether there is an increase in the speed or reliability of the computer; 5) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.¹⁵³

The *Aerotel* test is now the starting point for determining subject matter eligibility under subsection 1(2) of the U.K. Patent Act.¹⁵⁴

III. THE FAILURE OF TRIPS TO PROVIDE GUIDANCE ON THE GLOBAL APPLE-ANDROID PATENT DISPUTE

As discussed above in Parts II.B and II.C, courts in the United States and the U.K. came to very different results when looking at similar cases on the patentability of software. This section will compare the results of two cases: *Apple v. Samsung* in the United States,¹⁵⁵ and *HTC v. Apple* in the U.K.¹⁵⁶ The analysis will focus on two Apple patents¹⁵⁷ covering Apple's "multi-touch" feature found in iOS.¹⁵⁸ It will show that despite the similarity of these patents, the courts came to opposite conclusions. Part IV will then suggest changes to TRIPs to prevent such disparate results; including clarifying that software is patentable subject matter, while reducing the mandated patent

153. *Id.* at [41].

154. Crowne-Mohammed, *supra* note 135, at 475.

155. *Apple, Inc. v. Samsung Electronics Co.*, No. 11-CV-01846-LHK (N.D. Cal. Aug. 24, 2012).

156. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789.

157. The patents referred to cover similar aspects of multi-touch input. One is filed with the USPTO, and one with the European Patent Office ("EPO"). The U.S. Patent is U.S. Patent No. 7,844,915 (filed Jan. 7, 2007). The European patent is European Patent No. 2098948 (filed Apr. 3, 2009), referred to as "the '948 patent."

158. "Multi-touch" allows a user to control a computing device via touch screen with more than one finger. *Multitouch Definition*, PCMAG.COM, http://www.pcmag.com/encyclopedia_term/0,1237,t=multitouch&i=59067,00.asp (last visited Jan. 19, 2013).

term for software based on practical considerations of the software market and software itself.

A. Multi-touch in U.S. Courts and the USPTO: Valuable, but Nothing New

The *Apple v. Samsung* lawsuit in San Jose, California ended in a jury verdict that was an enormous victory for Apple—the company was awarded over one billion dollars when the jury determined that Samsung had infringed on several of Apple's patents.¹⁵⁹ The validity of the '915 patent was also vindicated.¹⁶⁰ The jury found that only three of the twenty-four devices at issue in the case did not infringe upon the '915 patent.¹⁶¹ To reach this conclusion, the jury was asked to engage in a multi-part analysis.¹⁶² First, the jury was asked to answer whether each Samsung device directly infringed¹⁶³ on the '915 patent through either "literal infringement"¹⁶⁴ or infringement under the "doctrine of equivalents."¹⁶⁵ Next, the jury had to consider whether the '915 patent was invalid under a clear and convinc-

159. Jessica E. Vascellaro, *Apple Wins Big in Patent Case*, WALL ST. J. (Aug. 25, 2012), <http://online.wsj.com/article/SB10000872396390444358404577609810658082898.html>.

160. Verdict Form, *supra* note 62, at 9.

161. *Id.* at 3.

162. See Final Jury Instructions, *Apple, Inc. v. Samsung Electronics Co.*, No. 11-CV-01846-LHK (N.D. Cal. Aug. 24, 2012) [hereinafter Jury Instructions].

163. *Id.* at 38–40.

164. A product was deemed to be literally infringing if every requirement of a patent claim was included in the product. *Id.* at 39. Apple asserted that Samsung infringed upon claim 8 of the '915 patent at trial. Florian Mueller, *Apple Insists That Samsung's Purported Workaround Still Infringes Pinch-to-Zoom API Patent*, FOSS PATENTS (Nov. 27, 2012), <http://www.fosspatents.com/2012/11/apple-insists-that-samsungs-alleged.html>. This claim covered distinguishing between a single finger and multiple fingers on a touchscreen. If a single finger is detected, the device will perform a scroll operation. If multiple fingers are detected, the device will "scal[e] the view" (zoom in or out). U.S. Patent No. 7,844,915 (filed Jan. 7, 2007).

165. A product was deemed to infringe under the doctrine of equivalents if it "include[ed] parts or software instructions that [were] identical to the requirements of the claim." A feature was deemed to be equivalent if "a person of ordinary skill in the field would think that the differences between the part or software instructions and the requirement were not substantial at the time of the alleged infringement." Jury Instructions, *supra* note 162, at 40.

ing evidence standard.¹⁶⁶ The jury could invalidate the patent if it lacked an adequate written description, if it was not new due to prior art,¹⁶⁷ if it fell under a statutory bar, or if it was “obvious.”¹⁶⁸ Finally, the jury was asked to calculate damages based on lost profits, lost market share, and any reasonable royalties owed to Apple by Samsung.¹⁶⁹

The jury agreed with Apple that the ‘915 patent was valid¹⁷⁰ and had been infringed by Samsung.¹⁷¹ This was a boon to Apple—Apple considered the ‘915 patent to be the most valuable multi-touch patent that it was asserting at trial based upon the royalties that it was demanding from Samsung.¹⁷² The verdict form asked the jury to break down damages by infringing device, and not by patent, so it is unclear how much value the jury placed on the ‘915 patent.¹⁷³ However, the total damage award was \$1,049,343,540.¹⁷⁴

Samsung had argued in its trial brief that the ‘915 patent was not invalid, not on subject matter grounds, but because other multi-touch inventions constituted prior art.¹⁷⁵ The jury disagreed with Samsung’s argument, as it found the ‘915 patent to be valid,¹⁷⁶ even though it had the option to rule the patent invalid on these grounds.¹⁷⁷ However, the USPTO later agreed with Samsung’s position.¹⁷⁸ In an ex parte reexamination hearing, the USPTO found that all twenty-one claims of the ‘915 patent were invalid due to other multi-touch patents

166. *Id.* at 42.

167. Prior art constitutes devices, methods, publications, or patents that predate the patent at issue and contain all of its claim’s requirements. *Id.* at 44.

168. *Id.* at 43–47.

169. *Id.* at 50–56.

170. Verdict Form, *supra* note 62, at 9.

171. *Id.* at 3.

172. Apple demanded \$3.10 per unit utilizing the ‘915 patent, compared to \$2.02 for the two other multi-touch utility patents that it asserted at trial. Florian Mueller, *Tentatively Invalid: The Most Valuable Multitouch Patent Asserted by Apple at Samsung Trial*, FOSS PATENTS (Dec. 20, 2012), <http://www.fosspatents.com/2012/12/tentatively-invalid-most-valuable.html>.

173. Verdict Form, *supra* note 62, at 16.

174. *Id.* at 15.

175. Samsung’s Trial Brief at 8, *Apple, Inc. v. Samsung Electronics Co., No. 11-CV-01846-LHK* (N.D. Cal. Aug. 24, 2012).

176. Verdict Form, *supra* note 62, at 9.

177. Jury Instructions, *supra* note 162, at 44.

178. Mueller, *supra* note 172.

that constituted prior art.¹⁷⁹ The USPTO cited U.S. Patent No. 7,724,242, a Japanese patent, and a 1991 academic paper as the prior art references.¹⁸⁰ The ruling is only preliminary—Apple will still have the opportunity to challenge the USPTO's findings.¹⁸¹

Two things are clear from looking at the '915 patent's experience in the U.S. courts and at the USPTO. First, if valid, the patent is extremely valuable. Apple believed that the '915 patent was its most valuable multi-touch patent in its case against Samsung, and the multi-touch patent contributed to one of the largest jury verdicts in patent litigation history.¹⁸² Second, even if the patent is invalid on prior art grounds, Samsung's failure to raise the prior art issue suggests that the patent is likely patentable subject matter.¹⁸³ Since the ruling is only preliminary, the USPTO may well still find that the '915 patent is valid.¹⁸⁴

B. Multi-touch in the U.K.: Not Even Patentable

Apple's European pinch-to-zoom patent had a very different experience in the U.K. The patent at issue in the *HTC* case was slightly different than the one litigated in the *Samsung* case. The patent covered software capable of distinguishing between single and multiple touches, however it also allowed individual applications to use "flags" to indicate to the operating system that multiple touches should be ignored if they were unneces-

179. *Id.*

180. *Id.*

181. Bryan Bishop, *Another Apple Patent Rejected by US Patent Office, but Its Fate Is Far from Certain*, VERGE (Dec. 19, 2012, 5:48 PM), <http://www.theverge.com/2012/12/19/3785788/another-apple-patent-rejected-by-us-patent-office-but-its-not-invalid-yet>.

182. Schubarth, *supra* note 2.

183. Samsung initially raised a defense arguing that the '915 patent was not patentable subject matter under 35 U.S.C. § 101 in its Answer. Samsung Entities' Answer, Affirmative Defenses, and Counterclaims to Apple Inc.'s Amended Complaint; and Demand for Jury Trial at 29, *Apple, Inc. v. Samsung Electronics Co.*, No. 11-CV-01846-LHK (N.D. Cal. Aug. 24, 2012) [hereinafter *Samsung Answer*]. When Samsung moved for summary judgment, however, it dropped this argument and instead only argued that its devices did not infringe on the '915 patent. Order Denying Motion for Summary Judgment at 22, *Apple, Inc. v. Samsung Electronics Co.*, No. 11-CV-01846-LHK (N.D. Cal. Aug. 24, 2012) [hereinafter *Summary Judgment Order*]. This strategy will be discussed in greater detail in Part III.C.

184. Bishop, *supra* note 181.

sary.¹⁸⁵ This approach was advantageous because software development could be more costly and complex if all applications were required to process multiple touches.¹⁸⁶ While this patent is somewhat different from the '915 patent asserted in *Apple v. Samsung*, they are largely similar, as both patents differentiate between single and multiple touches and direct the operating system to perform a function after detecting multiple touches.¹⁸⁷ Apple contended that an Android feature used in HTC phones used a similar flag process, thus violating Apple's patent.¹⁸⁸

In analyzing whether this method was patentable, the *HTC* court applied the *Aerotel* test and the *AT&T Knowledge Ventures* "signposts" to determine whether there was a "technical effect" within the meaning of *Aerotel*.¹⁸⁹ Apple's counsel contended that the invention met all of the *AT&T Knowledge Ventures* "signposts" for five reasons. First, the patent simplified software programming, a technical effect "outside the computer."¹⁹⁰ Second, the invention "operated at the level of the architecture of the computer" because it was incorporated into the operating system.¹⁹¹ Third, the invention resulted in the computer operating in a new way by providing a new set of application programming interfaces¹⁹² that allowed software developers to send touch events selectively.¹⁹³ Fourth, the invention

185. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [36]–[37].

186. European Patent No. 2098948 (filed Apr. 3, 2009).

187. Claim 8 of the '915 patent, the claim asserted at trial, distinguishes between single and multiple-point touches, interpreting single-point touches as a scroll command and multiple-point touches as a gesture command. U.S. Patent No. 7,844,915 (filed Jan. 7, 2007). The '948 patent at issue in the U.K. can distinguish between single and multiple touches, and allow applications to ignore multiple touches until the first touch is finished in order to eliminate conflicting commands. European Patent No. 2098948 (filed Apr. 3, 2009).

188. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [56].

189. *Id.* at [13], [17].

190. *Id.* at [92].

191. *Id.*

192. An "application programming interface," or API, is a command set that "allows programmers to use predefined functions . . . instead of writing them from scratch," making programming easier. *API (Application Programming Interface)* *Definition*, TECHTERMS.COM, <http://www.techterms.com/definition/api> (last visited Oct. 5, 2013).

193. *HTC Europe Co. LTD v. Apple Inc.*, [2012] EWHC (Pat) 1789, [92].

increased speed and reliability because it simplified application coding.¹⁹⁴ Finally, the invention solved the problem that it was purported to address.¹⁹⁵

The court rejected all of Apple's arguments and first reverted to the *Aerotel* test by asking what the invention's contributions were and whether they were "wholly within excluded subject matter."¹⁹⁶ The court found that software "which processes the multi-touch input" was "plainly excluded subject matter."¹⁹⁷ So too was any contribution that made writing software easier, as "[t]he writing of programs for computers . . . fall[s] squarely within the exclusion of computer programs as such."¹⁹⁸

The court then analyzed whether there was a relevant technical effect as Apple claimed.¹⁹⁹ It concluded that ease of writing software could not be a relevant technical effect, as writing software was excluded, and increased ease "merely . . . redistribut[es] . . . the labour."²⁰⁰ Additionally, Apple's valid assertion that the invention operated at the operating system level was insufficient because the patent only concerned operation on data in the form of touch events.²⁰¹ Next, the new APIs did not cause the computer to work in a new way, as the invention "merely . . . redistribute[d] . . . data processing within the device."²⁰² Finally, there was no evidence of an increase of speed or reliability, and the fact that the invention solved a problem was irrelevant "where the problem solved [was] entirely within the computer."²⁰³ Accordingly, the court found that the invention was not patentable, as it was a "computer program as such."²⁰⁴

The results of the *HTC v. Apple* case illustrate the differences of the U.K.'s approach to software patentability in comparison to the United States. The court was very skeptical of Apple's claims, rejecting every argument Apple made that the contri-

194. *Id.*

195. *Id.*

196. *Id.* at [93].

197. *Id.* at [94].

198. *Id.*

199. *Id.* at [95].

200. *Id.*

201. *Id.* at [96].

202. *Id.* at [97].

203. *Id.* at [98].

204. *Id.* at [99].

bution of its '948 patent was "technical in nature."²⁰⁵ In the end, the '948 patent was ruled to be invalid as non-patentable subject matter.²⁰⁶ Three other patents were asserted against HTC, each of which was found to be either invalid for obviousness or in light of prior art, or not infringed by HTC.²⁰⁷ This stands in stark contrast to *Apple v. Samsung*, where Apple's similar '915 patent was found to be valid and infringed.²⁰⁸

C. Reconciling the Disparate Results Reached in the United States and the U.K.

The disparate results reached in *Apple v. Samsung* and *HTC v. Apple* are in part due to the different approaches that the United States and the U.K. use to evaluate the patentability of software. Although the *Apple v. Samsung* court did not reach the issue of whether the '915 patent constituted patentable subject matter, this was because Samsung had dropped that argument. Samsung did assert an excluded subject matter defense in its initial answer to Apple's amended complaint.²⁰⁹ However, when Samsung moved for summary judgment, it instead argued that its devices did not infringe upon the '915 patent.²¹⁰ Presumably, Samsung would have argued that the '915 patent was ineligible subject matter in this motion if it felt that this was a strong claim, as a successful summary judgment motion on these grounds can rule a patent invalid.²¹¹ This would have eliminated the need for Samsung to defend against the '915 patent at trial. Instead, it argued—unsuccessfully—that its devices did not infringe on the '915 patent.²¹² Samsung's refusal to bring such a powerful defense suggests that Samsung itself thought that the '915 patent would be found valid under the U.S. standard.

205. *Id.* at [93].

206. *Id.* at [363].

207. *Id.*

208. Verdict Form, *supra* note 62, at 3, 9.

209. Samsung Answer, *supra* note 183, at 29.

210. Summary Judgment Order, *supra* note 183, at 22.

211. *See SmartGene, Inc. v. Advanced Biological Labs., SA*, 852 F.Supp.2d 42, 66 (D.D.C. 2012), *reconsideration denied*, Civ. A. No. 08-00642 BAH, 2013 WL 40321 (D.D.C. Jan. 3, 2013), *reconsideration denied*, 915 F. Supp. 2d 69 (D.D.C. 2013) (invalidating a patent as ineligible subject matter under 35 U.S.C. § 101 on a motion for partial summary judgment).

212. *See* Summary Judgment Order, *supra* note 183, at 22.

By contrast, HTC was able to render Apple's '948 patent invalid in the U.K. by challenging whether it was patentable subject matter in the first place.²¹³ The fact that this multi-touch patent, similar to the one asserted in *Apple v. Samsung*, was rendered invalid illustrates the narrower view that the U.K. takes toward software patentability discussed above.²¹⁴ In fact, the court's reasoning suggested that the U.S. patent might not be patentable in the U.K., as it found that "the software which processes the multi-touch input . . . is plainly excluded subject matter."²¹⁵ Additionally, HTC argued that the other three Apple patents asserted at trial were excluded subject matter.²¹⁶ This shows that the differing legal standards impacted HTC and Samsung's trial strategies, as HTC repeatedly asserted that Apple's software patents were invalid, while Samsung declined to even bring the argument in its summary judgment motion.²¹⁷ The fact that such disparate legal standards, legal strategies, and results can be seen in two countries that are both signatories to TRIPs demonstrates that the treaty has not provided much guidance on what is patentable in the field of software.

IV. MODIFYING TRIPs TO PROVIDE FOR INCREASED COMPETITION IN THE FIELDS OF SOFTWARE AND CONSUMER ELECTRONICS

As demonstrated above, the TRIPs Agreement is vague as it applies to software, both in terms of whether it applies to software and what it requires for software to be patentable.²¹⁸ This has fostered great differences in the legal standards that its signatories have adopted for software patentability, leading to uncertainty in international patent litigation and influencing the legal strategies adopted by litigants.²¹⁹ Additionally, the fast-moving nature of the software and consumer electronics markets raises concerns that the blanket twenty-year mini-

213. HTC Europe Co. LTD v. Apple Inc., [2012] EWHC (Pat) 1789, [363].

214. See *supra* Part II.C.

215. HTC Europe Co. LTD v. Apple Inc., [2012] EWHC (Pat) 1789, [94].

216. *Id.* at [238], [280], [358].

217. See Summary Judgment Order, *supra* note 183, at 17–18 (addressing Samsung's sole summary judgment claim of non-infringement, with no discussion of excluded subject matter).

218. See *supra* Part II.A.

219. See *supra* Part III.

imum patent term under TRIPs overprotects software and restricts competition decades after a patent is granted.²²⁰ This Note offers two solutions. First, TRIPs should be modified to explicitly state that software is patentable subject matter and to clarify what qualifies as a “new . . . inventive step . . . capable of industrial application” under Article 27.²²¹ Second, the minimum patent term for software under TRIPs should be reduced from twenty years to five years, allowing signatories to adopt patent terms that better reflect market realities. These changes would aid consumer electronics product development by increasing the predictability of global software patentability, and increase competition by allowing signatories to deny monopolies that extend far beyond the scope and product life of the original invention.

A. TRIPs Should be Modified to Clarify that Software is Patentable Subject Matter, with a Clear Standard Readily Adoptable by Legislatures

The lack of clarity on software patentability is one of the chief failures of TRIPs that must be addressed. Conflicting language in Article 27 of TRIPs has left it unclear whether “pure” software with no physical manifestation is patentable, and what standard of patentability should be adopted for software.²²² The ambiguity of Article 27 has therefore left these questions largely up to signatory countries.²²³ The differences that result are clearly illustrated in the differences between the U.S. and U.K. approaches to patent law, as discussed in Parts II.B and II.C. This ambiguity has disadvantages that harm the global markets for software and consumer electronics. The varying legal standards for software patentability can lead to disparate results in patent litigation, as seen in the *Apple v. Samsung* and *HTC v. Apple* cases. The prospect of disparate results can set off global patent battles of the type seen here; invalidation or enforcement in one country may just prompt further litigation

220. Note, *Computer Intellectual Property and Conceptual Severance*, 103 HARV. L. REV. 1046, 1062 (1990).

221. TRIPs Agreement, *supra* note 25, art. 27.

222. Charfoos, *supra* note 82, at 281–82.

223. *Id.* at 282.

in another.²²⁴ This unpredictability increases the costs of patent litigation by requiring patent holders and defendants to prepare for litigation under a dizzying number of legal standards.²²⁵ Often, the only entities that can bear the high costs of international patent litigation are large corporations, placing new inventors and startup companies at a disadvantage.²²⁶ These issues demonstrate the toll that the current ambiguity of software patentability has taken on global markets by complicating the process of marketing software and consumer electronics globally.²²⁷

TRIPs should therefore be modified to explicitly state that software is patentable subject matter. Further, it should allow patents on “pure software,” without effects external to the computer, provided that it meets the remaining requirements under TRIPs. Software is certainly a “field of technology,” as required under Article 27 of TRIPs;²²⁸ the question is if it is incapable of “industrial application” absent some effect external to the software itself.²²⁹ Some speculate that TRIPs did not adopt “pure software” patents because diverging views precluded them.²³⁰ But even countries with narrow patent regimes, like the U.K., allow “pure software” patents in some instances.²³¹ A more unified global standard will provide numerous advantages to software and consumer electronics firms by increasing incentives to invent while protecting software developers globally.²³² Additionally, a clear standard for software patentability will increase predictability in the international

224. John R. Thomas, *Litigation Beyond the Technological Frontier: Comparative Approaches to Multinational Patent Enforcement*, 27 LAW & POL'Y INT'L BUS. 277, 291 (1996).

225. Dongwook Chun, *Patent Law Harmonization in the Age of Globalization: The Necessity and Strategy for a Pragmatic Outcome*, 93 J. PAT. & TRADEMARK OFF. SOC'Y 127, 136–37 (2011).

226. Thomas, *supra* note 224, at 291.

227. Chun, *supra* note 225, at 136–37.

228. TRIPs Agreement, *supra* note 25, art. 27.

229. Charfoos, *supra* note 82, at 281.

230. *Id.*

231. See AT&T Knowledge Ventures LP, Re [2009] EWHC (Pat) 343, [40] (finding software may be patentable subject matter where, among other things, it “results in the computer operating in a new way” or “increase[s] . . . the speed or reliability of the computer”).

232. Robert R. Willis, *International Patent Law: Should United States and Foreign Patent Laws Be Uniform? An Analysis of the Benefits, Problems, and Barriers*, 10 N.C.J. L. & TECH. 283, 300 (2009).

patent system.²³³ In turn, greater predictability will reduce the cost of global patent litigation²³⁴ and allow software firms to better focus their research and development.²³⁵ In sum, modifying TRIPs to clarify the legal standard for software patentability would help foster innovation in the field while saving vast sums on litigation that could instead be spent on research and development.

B. TRIPs Should Reduce the Minimum Patent Term for Software to Accommodate the Unique Attributes of the Software and Consumer Electronics Industries

While clarifying TRIPs to allow for “pure software” patents would have numerous advantages, it would also substantially broaden the scope of patentability. This creates additional problems, as broad standards for software patentability have contributed to the massive proliferation of software patents.²³⁶ This proliferation creates “patent thickets” that must be “hacked” through by competitors before a product can be commercialized, creating significant barriers to entry.²³⁷ As more patents for software are issued, it becomes increasingly likely that a new product will accidentally infringe upon a patent.²³⁸ This can be particularly problematic in the smartphone industry, as the average smartphone implicates approximately 200,000 patents.²³⁹ Further, large companies frequently amass software patents not for use in an invention, but to obtain bet-

233. Erwin F. Berrier, Jr., *Global Patent Costs Must Be Reduced*, 36 IDEA 473, 479–80 (1996).

234. Willis, *supra* note 232, at 300.

235. Chun, *supra* note 225, at 136.

236. Robert A. Migliorini, *The Narrowed Experimental Use Exception to Patent Infringement and Its Application to Patented Computer Software*, 88 J. PAT. & TRADEMARK OFF. SOC'Y 523, 525 (2006).

237. David A. Balto & Andrew M. Wolman, *Intellectual Property and Anti-trust: General Principles*, 43 IDEA 395, 473 (2003).

238. Kirk D. Rowe, *Why Pay for What's Free?: Minimizing the Patent Threat to Free and Open Source Software*, 7 J. MARSHALL REV. INTELL. PROP. L. 595, 604 n.79 (2008).

239. *The Android Patent War*, WALL ST. J. (Dec. 5, 2011), <http://online.wsj.com/article/SB10001424052970204826704577074523539966352.html>.

ter bargaining positions in cross-licensing negotiations.²⁴⁰ The massive proliferation of software patents puts small firms and startups at a serious disadvantage, as it costs on average over one million dollars to challenge a patent.²⁴¹

Many of these problems could be solved if the patent period for software was significantly reduced to five years, lessening the incentive to amass patents.²⁴² However, TRIPs currently stands as a barrier to such action, as the treaty mandates a twenty-year minimum patent period regardless of the field of technology.²⁴³ TRIPs should therefore be modified to create an exception for software, reducing the minimum patent term to five years. There are significant differences in the software industry that counsel such an approach. While some industries, like pharmaceuticals, require long patent periods to allow firms to recoup research costs, software development is relatively cheap.²⁴⁴ Additionally, software has a very short "shelf life," as advances in the field typically render a patent obsolete before the term even expires.²⁴⁵ Software is also designed by using existing algorithms to perform new functions in a "building block" approach.²⁴⁶ Preventing these algorithms from entering the public domain harms innovation by preventing new developers from using these tools to improve upon the basic building blocks of the industry.²⁴⁷ Therefore, modifying TRIPs to allow for a shorter patent term would improve innovation by allowing the necessary tools for development to enter the public domain earlier.

240. David S. Evans & Anne Layne-Farrar, *Software Patents and Open Source: The Battle over Intellectual Property Rights*, 9 VA. J.L. & TECH. 10, 54 (2004).

241. James Gleick, *Patently Absurd*, N.Y. TIMES (Mar. 12, 2000), <http://www.nytimes.com/library/magazine/home/20000312mag-patents.html>.

242. See James Bessen, *Patent Thickets: Strategic Patenting of Complex Technologies*, at 10 n.13 (Working Paper Series, March 2003), available at <http://ssrn.com/abstract=327760>.

243. TRIPs Agreement, *supra* note 25, art. 27.

244. Rowe, *supra* note 238, at 607-08.

245. Allen Clark Zoracki, *When Is an Algorithm Invented? The Need for a New Paradigm for Evaluating an Algorithm for Intellectual Property Protection*, 15 ALB. L.J. SCI. & TECH. 579, 594-95 (2005).

246. Rowe, *supra* note 238, at 607.

247. Zoracki, *supra* note 245, at 595.

CONCLUSION

While the TRIPs regime was a landmark development in global intellectual property rights and patent harmonization, it was drafted while the consumer software industry was in a state of relative infancy. Since it was adopted, software and consumer electronics have become one of the most important industries for global trade and technological development. TRIPs should therefore be revisited to reflect this reality by clarifying the level of protection that software receives, while reducing its patent term to bring more software into the public domain and encourage innovation. This will not be an easy task—TRIPs took over seven years of negotiations to be passed in its current form.²⁴⁸ However, the ambiguous status of the global patent system illustrated by the recent Apple-Android patent war demonstrates that action must be taken. With some effort, a system can be adopted that serves the software and consumer electronics industries rather than hindering them.

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248. Frederick M. Abbott, *The WTO Trips Agreement and Global Economic Development*, 72 CHI.-KENT L. REV. 385, 385 (1996).

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