

Smartphone Patent Litigation and Standard Essential Patents: A Success Story

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For a number of years, the “smartphone wars” have been blamed, at least in part, for causing a broken and chaotic patent system. These cries of crisis reached their peak in the summer of 2012, when Judge Posner, sitting by designation, ruled in one of the then pending *Apple v. Motorola* cases,¹ and, as reported by the *New York Times*, observed that “[t]here’s a real chaos” in the patent system.² In reporting on patent litigation between Apple, Samsung, Motorola, Microsoft, HTC, and others—i.e., the smartphone wars—the *New York Times* further recounted views of industry participants that the patent system is “so flawed that it often stymies innovation,” and that it is “corrupted by software patents used as destructive weapons.”³ As one organization observed, “[t]he patent system is broken” as evidenced by patent owners’ attempts in the smartphone wars to extract damages and seek injunctions by asserting software patents and patents essential for the implementation of technical standards, i.e., standard essential patents or SEPs.⁴

While patent trolls and patent assertion entities have more recently been the targets of blame for the “broken” or “chaotic” patent system, some still try to use the smartphone wars as a reason to adopt changes in how the law treats software patents, and in the intellectual property policies of standard-setting organizations (SSOs) with respect to the royalties and injunctive relief for SEP owners.

This article addresses whether the so-called smartphone wars provide a basis for these continuing cries of alarm, or if they ever did. Based on historical and empirical evidence, it appears not. If anything, innovation in wireless and cellular industries, which is based on the development and implementation of standardized technologies, is at an all-time high. Moreover, a growing body of literature and data suggests that the existence of litigation in the wireless and cellular space is consistent with historical norms and expectations when new, breakthrough technologies are introduced. Increased litigation reflects natural competition among incumbent firms and new entrants. The extent of smartphone litigation actually trailed the pace of litigation in the past when new technologies were introduced. Finally, recent studies indicate that neither SEPs nor software patents are a determinative influence in smartphone litigation.

In other words, when considered objectively, the so-called smartphone wars do not indicate a “broken” or “chaotic” patent system. To the contrary, this highly publicized litigation among industry giants may reflect a well-ordered competitive marketplace where innovation has continued to flow at an increasingly rapid pace.

Mobile and Cellular Innovation Is Exploding

If the so-called smartphone wars evidenced a broken or chaotic patent system, driven by the improper assertion of SEPs or weak software patents, one could expect that the rate of innovation in wireless and cellular industries would be slowing, and that competition for wireless and cellular products and services would be impeded. But the opposite is true.

The Boston Consulting Group (BCG) recently reported that “[g]lobally, mobile technology has emerged as a primary engine of economic growth, stimulating enormous private-sector spending in both R&D and infrastructure, and profoundly changing daily lives—everywhere.”⁵ The BCG study supports this conclusion with findings, among others, that:

- Mobile communications standards have propelled mobile to become the fastest adopted technology of all time, with decreased (and decreasing) user costs, skyrocketing increases in data-transmission speeds, and user adoptions growing to nearly three billion connections in less than 15 years, with projected connections by 2020 to exceed eight billion.
- Aggregate annual consumer value for mobile technologies across six countries (the United States, Germany, South Korea, Brazil, China, and India) is \$6.4 trillion above the cost of devices and services.
- The mobile value chain generated \$3.3 trillion in revenue globally in 2014 and was directly responsible for 11 million jobs.
- Small and medium-sized enterprises (SMEs) that use mobile services more intensively than their peers see their revenues growing up to two times faster and are adding jobs up to eight times faster than similarly situated firms.
- Private-sector funded investment in mobile infrastructure and R&D from 2009 through 2013 was \$1.8 trillion, and within the last five years venture capital (VC) investments in mobile have doubled as a percentage of total VC investments, reaching almost 8 percent (\$37 billion) in 2014.⁶

The BCG reached similar conclusions in a study focused on the global mobile Internet economy. In particular, BCG found that the rapid adoption of smartphones and tablets, and competition among vendors of such products and related services, has had an enormous global economic impact, including by propelling growth in the development of applications, content, and services; generating consumer surplus of approximately \$3.5 trillion a year; and facilitating affordability and accessibility for consumers globally.⁷

Similar dynamic growth in mobile and cellular products and services, much if not all of which is compliant with standards based upon patented technology, has been reported by others. For example, according to an August 2011 report by Gartner Research,⁸ worldwide sales of mobile devices to end users totaled 428.7 million units in the second quarter of 2011, a 16.5 percent increase from the second quar-

ter of 2010. Also according to Gartner, smartphone sales were up 74 percent year-on-year and accounted for 25 percent of overall handset sales in the second quarter of 2011, up from 17 percent in the same quarter of 2010. And, according to a very recent report by Ericsson, this expansion has continued, as reflected by the 300 million new mobile subscriptions globally just in the first three quarters of 2015.⁹ Moreover, it has recently been reported by GSMA that the mobile ecosystem generated 3.8 percent of the global gross domestic product in 2014, which amounted to over \$3 trillion of economic value across 236 countries.¹⁰

Such trends are projected to continue. Ericsson predicts, for example, that total mobile subscriptions will grow from 7.1 billion in 2014 to 9.1 billion in 2021, comprised of a growth of mobile broadband subscriptions from 2.9 billion in 2014 to 7.7 billion in 2021; smartphone subscriptions from 2.6 billion in 2014 to 6.4 billion in 2021; and mobile PCs, tablets, and routers from 250 million in 2014 to 350 million in 2021.¹¹ The GSMA reports similarly that “[t]he world is seeing a rapid technology migration to both higher speed mobile broadband networks and the increased adoption of smartphones and other connected devices.”¹² And GSMA projects that:

- Mobile broadband will increase from 40 percent of the global base in 2014 to 70 percent in 2020.
- Smartphones accounted for 60 percent of all connections in developed markets in 2014 and will add 2.9 billion more connections by 2020.
- Data traffic, fueled by the growth of new services and applications, is expected to increase tenfold by 2019.
- Capital expenditures by carriers for infrastructure is expected to total \$1.4 trillion out to 2020, with 3G coverage expected to reach 86 percent of the world’s population by 2020, and 4G is being built out at a faster pace than was 3G.
- Use of the mobile Internet will grow from 2.4 billion people in 2014 to 3.8 billion in 2020.¹³

These observable marketplace characteristics are not consistent with a broken or chaotic patent or standards-development system. The wireless and cellular technology driving this performance, as mentioned, is the result of successive generations of standards that include hundreds, thousands, and even hundreds of thousands of patents that are potentially essential for implementing them. Nor do these characteristics support the suggestion that smartphone wars are emblematic of such a broken or chaotic patent system. Indeed, given the rate of innovation and technological growth, extreme caution might be warranted before implementing changes to current rules, and such changes might only be appropriate where there is objective verification that problems actually do exist and that whatever changes are made will not have far worse unintended negative consequences.

Smartphone Patent Litigation Is Historically Unexceptionable

Cases comprising the smartphone wars usually involve substantial head-to-head competitors, or incumbents against new entrants, fighting for competitive marketplace advantage over the use of continually evolving technology. We have seen Apple and Samsung battle, as well as Microsoft and Motorola, Apple and Motorola, and most recently Ericsson and Apple, to name a few. Given this dynamic, commenters have suggested that this litigation does not reflect a broken or chaotic patent system, undermined by SEPs and software patents. Rather, when placed in historical context, these commenters submit that the

nature and extent of the smartphone wars should be expected when new vibrant technology is introduced into the marketplace. Among other things, the existence of “patent wars” attendant to industrial and technological development indicates that the current state of affairs is nothing new.

As former director of the U.S. Patent and Trademark Office (USPTO) David Kappos remarked “to those reporting and commenting on the smartphone patent wars as if to suggest that the system is broken: let’s move beyond flippant rhetoric and instead engage in thoughtful discussion.”¹⁴ Director Kappos further explained:

The current software patent “war” is hardly the first patent war—and unlikely to be the last in our nation’s patent history. Whenever breakthrough technologies come onto the scene, market players find themselves joined in the marketplace by new entrants. The first instinct of the breakthrough innovators is to bring patents into play. This is not only understandable, it is appropriate. Those who invest in breakthrough innovation have a right to expect others to respect their resultant IP. However, in the end, as history has shown time and time again, the players ultimately end up agreeing to pro-consumer solutions via licenses, cross-licenses, or joint development agreements allowing core technologies to be shared.¹⁵

Benoît Battistelli, president of the European Patent Office (EPO), has commented similarly that the so-called “patent wars” reflect nothing more than the increased risk of competitive conflict resulting from the growth of innovation that is encouraged by the patent system.¹⁶ Director Kappos likewise opined:

[T]he patent wars common to the tech sector—and particularly smartphones—are hardly a sign that the system is broken, but rather a hallmark of robust innovation. . . . I do not believe [the patent wars are] a sign that there’s anything at all wrong with the innovation environment in the U.S. In fact, I think it’s a byproduct of a very healthy overall innovation environment. These things happen. They sort themselves out.¹⁷

Joseph Farrell, former chief economist of the Federal Trade Commission, also testified:

[T]here’s a temptation, I think, to say—to identify problems with disputes, maybe even for lawyers, problems with disputes that make it to litigation. I don’t think you can do that, and I don’t think you can do it in either direction. Just because there’s a dispute doesn’t mean that there is a breakdown of the system. Somebody might be being unreasonable, and certainly, if you had that as a rule of general inference or procedure, it would give whacko incentives to people to dispute perfectly reasonable offers, okay? So we can’t assume that the presence of a dispute means the presence of a problem.¹⁸

Others have confirmed this perspective by looking at the historical record. Many have pointed out that the smartphone wars are not a new phenomenon. To the contrary, repeatedly throughout the industrial age breakthrough inventions were accompanied by increased patent litigation activity. This occurred, for example, when Eli Whitney patented the cotton gin in 1794; when Elias Howe patented the eye-pointed needle sewing machine in 1846; when the Wright brothers patented aviation wing and steering technology in 1906; and when Gordon Gould developed laser technology in the late 1950s and then oth-

ers independently developed the same technology.¹⁹ Thus, rather than being a “modern problem” arising from recent changes in technology and law, historical commenters have confirmed the observations of then Director Kappos and EPO President Battistelli, that the existence of smartphone patent wars is not abnormal or anomalous, and could have in fact been predicted.²⁰

Indeed, available data indicate that the extent of smartphone patent litigation is less than the litigation that accompanied other technological breakthroughs. For example, one report states: “The estimated 124-plus smartphone patent suits filed between 2009–2012 are less than one-quarter the number of patent suits filed during the first ‘Telephone Wars’ of Alexander Graham Bell’s time. Back then, the American Bell Telephone Company and its successor, AT&T, litigated an astonishing 587 patent cases alone.”²¹ Similarly, it has been reported that the average litigation rate—i.e., the rate of litigated patents as compared to the number of issued patents—was 1.65 percent from 1790–1860, and 3.6 percent during the period of 1840–1849. In comparison, the rate of patent litigation in the 2000s is reported to be around 1.5 percent.²²

At a minimum, the foregoing suggests the extent and nature of recent smartphone patent litigation falls far short of a war requiring legislative, legal, or administrative reforms, especially when considered in light of the competitive marketplace and innovation-enhancing performance discussed earlier. Instead, reliance on the natural evolution of competition may reconcile existing conflicts. Apple’s and Motorola’s global settlement resolving their disputes and the overall decrease (based on data discussed below) of smartphone patent litigation in recent years supports this hypothesis.

Data Belies Claims That SEPs and Weak Software Patents Cause Smartphone Litigation

Growing reliance on two types of patents is often cited as underlying the smartphone wars: (1) SEPs, i.e., patents that are necessarily infringed when implementing a standard; and (2) software patents that are purportedly weak or invalid. Recent studies, however, present data that belies these claims.

SEPs Have Not Had a Systematic Effect on Patent Infringement Litigation

Smartphones are based on a number of wireless and cellular standards. These include the 2G, 3G, and LTE cellular standards developed by 3GPP and 3GPP2; the Wi-Fi standards developed as part of the IEEE 802.11 family of standards; and the ITU’s H.264 codec standard. With respect to each, many hundreds, if not thousands, of patents have been identified as potentially essential. This, some commenters have claimed, creates risks that SEP owners will “hold up” infringing downstream implementers who are locked into using the technology covered by the SEPs in order to build standard-compliant products. Commenters say that this hold-up occurs because an SEP owner can seek an injunction and compel an infringing implementer to pay a higher royalty than it would otherwise pay.²³ Smartphone patent litigation is claimed to reflect this risk of hold-up.

A growing consensus is emerging, however, that the models used to portray risks of hold-up did not accurately predict real-world behavior. A recent study by Kirti Gupta and Mark Snyder concludes that smartphone litigation is primarily driven not by patents that are related to standards but rather by patents on implementation or design-specific features of mobile devices. This study further concludes

that litigation outcomes are driven by patent quality rather than the type of patents (SEPs or not), and that the rise in smartphone litigation can be explained by a disruption in the mobile wireless ecosystem due to new and large industry entrants, and that this litigation trend may be declining.²⁴

As an initial step, Gupta and Snyder collected data from 111 United States district court (83) and International Trade Commission (ITC) (28) cases during 2000–2013. These cases involved 402 unique patents, which had been asserted 851 times. The authors also gathered additional data concerning patent characteristics, such as citations, number of claims, and geographic coverage. Then, using case pleadings and information from SSOs, the authors identified whether SEPs were involved in the litigations. The authors' approach overstated the incidence of SEPs because it relied on a plaintiff's (or petitioner's for the ITC) allegations regarding the nature of the asserted patents, and on declarations to major SSOs that a patent *may* be essential to a standard.

Patent Level Statistics	No. of Patents	No. of Potential SEPs
Total Asserted Patents	851	262
Total Unique Patents	402	144
Patents Found Infringed	14	4
Patents with Injunction	6	0
Preliminary	1	0
Permanent	0	0
LEO or CDO (ITC)	5	0
Patents Found Invalid	12	6

Based on this data set (see tbl. 1), Gupta and Snyder concluded that most of the patents involved in smartphone litigation were *not* SEPs or potential SEPs, i.e., nonessential patents or NEPs (64% NEPs vs. 36% SEPs). Most notably, as of July 2013, no injunction or exclusion order had been granted in connection with any patent identified as an SEP.

The authors then undertook a follow-on study to expand the original data set. The expanded data identified 513 unique firms, involved in 427 U.S. district court cases and 70 ITC investigations through 2014. These cases involved 1,475 unique patents, which were asserted 2,463 times.

Patent Level Statistics	No. of Patents	No. of Potential SEPs
Total Asserted Patents	2,463	522
Total Unique Patents	1,475	280
Patents Found Infringed	89	24
Patents with Injunction	44	1
Preliminary	4	0
Permanent	18	1
LEO or CDO (ITC)	22	0
Patents Found Invalid	52	18

Thus, the expanded data set (see tbl. 2), which included more current data than the initial data set, showed an even lesser incidence of SEPs involved in smartphone litigation (81% NEPs vs. 19% SEPs). And, in only one case was an injunction issued in connection with an alleged SEP.²⁵

Both data sets also show that the number of smartphone cases is dropping precipitously. The first set showed a high of 31 such cases in 2010 (none of which involved SEPs) to eight in 2013 (when four involved SEPs). The second set showed a high of 66 cases in 2012 (with 28 involving SEPs), and only 13 cases in 2014 (with one case involving SEPs).

In summary, Gupta and Snyder concluded:

- The so-called smartphone wars do not appear driven by SEPs;
- The large majority of the patents asserted are not pleaded/declared as potentially essential to standards; and
- Most of the disputes do not involve at least one potential SEP;
- The likelihood of obtaining an injunction is far greater for NEPs than for SEPs—in only one case has an injunction been issued in connection with a claimed SEP;
- Arguments that hold-up results from threats of injunctions for SEPs do not appear well founded, because injunctions are seldom, if ever, granted for SEPs, and in any event are not granted unless a court finds such relief to be justified based on the actions of the infringer; and
- Smartphone patent litigation appears to be on the decline, with the spike occurring within a short timeframe.

Software Patents Are Not Driving Smartphone Infringement Litigation

Another study by Stuart Graham and Saurabh Vishnubhakat considered whether software patents are empirically a driver of smartphone litigation.²⁶ It concluded that they were not. Notably, the results of this study were published in 2013, before the Supreme Court’s decision in *Alice Corp. Pty. Ltd. v. CLS Bank International*,²⁷ which has led to increased validity challenges to business method patents, many of which are based on software algorithms. The findings of this study, therefore, are not affected by the *Alice* holding.

To establish their data set, Graham and Vishnubhakat identified 13 high-profile infringement litigations involving four major firms: Motorola, Microsoft, Apple, and Samsung. In these cases, 133 patents were initially asserted, but a substantial number were dismissed from the cases, leaving 73 patents in controversy. A technology expert of the USPTO reviewed these patents, and determined that 65 of the patents

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contained at least one claim that could be considered software related. But while the asserted patents included software claims, they did not typically claim inventions related to software elements. The authors did not find this surprising because smartphones include significant technology other than software, e.g., technology relating to displays, microprocessors, signal processing, and transmission.²⁸

Of the 65 patents with at least one software claim, as of the date of the report, the likely validity or invalidity of 21 had been considered by courts. Only four of the 21 were found to be invalid or likely invalid, with the remaining 17 being found to be valid or likely valid. In other words, of the considered software patents, 80 percent were found valid or likely valid. Based on these results, Graham and Vishnubhakat observed that the rate of validity findings compared favorably with other technology areas, but was not consistent with the view that smartphone litigation is driven by low-quality software patents.²⁹

More empirical study is warranted with respect to SEPs and software patents and their potential impact on litigation trends. The Gupta and Snyder and Graham and Vishnubhakat studies, however, point out that alarmist warnings that SEPs and software patents are undermining innovation because they incite smartphone litigation wars must be considered skeptically.

Conclusion

The observational, historical, and empirical evidence presented here is only an overview focused on what seem to be unfounded claims that smartphone litigation has hampered innovation, and that such litigation was fostered by assertion of SEPs and software patents. As mentioned, more study of these (and other areas relating to the state of the patent system) is always appropriate. Such efforts will benefit from a focus on and analysis of concrete objective evidence, rather than hypothetical theorizing. Moreover, policy considerations with respect to the patent and standards development systems would also benefit from more objectively focused analyses, rather than from perceived risks of theoretical harms. Otherwise, the great benefits that are occurring specifically in cellular and wireless industries, and the consumer wealth that is being created, could be put at risk.

Endnotes

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25. See *TruePosition Inc. v. Andrews Corp.*, No. 05-747-SLR, 2010 U.S. Dist. LEXIS 43510 (D. Del. May 4, 2010). Even this, however, may overstate the instances that an injunction has been issued in connection with asserted SEPs because in *TruePosition* there was not a final determination that the asserted patent was essential to implement a standard.

26. See Graham & Vishnubhakat, *supra* note 19. The legitimacy of the view that low-quality software patents have led to disruptive smartphone litigation should also be considered in light of such litigation in Europe where software is not patentable.

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28. Graham & Vishnubhakat, *supra* note 19, at 73.

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