The Brothers Grimm Book of Business Models: A Survey of Literature and Developments in Patent Acquisition and Litigation

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March 21, 2012

Although they have received the lion's share of the limelight in recent years, it is not just "trolls" shaping the patent landscape today; "giants" and "dwarves" are in the thicket as well. The trolls, of course, are those patent holders that do not practice their patents, but instead seek to profit from litigating them. As trolls are relatively new to the scene, emerging in force in the 1990s, they have commanded the spotlight for some years. But the giants have always been present: those large, multinational firms with both extensive patent portfolios and products practicing them. One step down from the giants are the "dwarves" – firms with a large presence in one market, entering another for which they have few or no relevant patents. The events of 2011 provided a sharp reminder to keep a watch on the giants and dwarves too – and indeed on all business models involving intellectual property (IP). The patent ecosystem is a diverse one and creatures of all stripes each add their own twist.

This article provides a survey of key patent-related events taking place in 2011 and takes stock of the current patent acquisition and litigation landscape. Specifically, I review the empirical literature on patent assertion entities (a less derogative and more descriptive term than "patent troll", as explained below), assess the patent auctions that were held throughout 2011 and over which the giants and dwarves battled fiercely, and survey the numerous patent infringement lawsuits currently underway, cases which include troll, giant, and dwarf plaintiffs. The patent acquisition and litigation sections focus on the wireless telecom ecosystem, as this is where the most heated battles are occurring. I then offer my thoughts on the forces that have led to the remarkable patent acquisition and litigation activity

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within wireless over the last few years. I close the article with some thoughts on the likely future of the IP battles.

Portrait of a "troll"

First, a bit a nomenclature. The term "patent troll" is certainly colorful, and it does describe in broad terms the actions against which so many have complained: the charging of a toll for access to something the troll did not create and likely has been holding in reserve until the price was right.[2] But the term has also been used far too expansively and too pejoratively for use in constructive debate. Indeed, the term "troll" initially was applied to all non-practicing entities (NPEs); essentially any firm that was not practicing its patents was dubbed a troll.[3]

As has been pointed out in the academic literature, however, many NPEs do not behave like stereotypical "trolls". Universities, for example, fall squarely in the NPE camp because they do not make things.[4] However, their patents come from their staff's research, many universities have active patent licensing (or "Technology Transfer") offices that seek to monetize faculty patents without "holding them in reserve", and universities occasionally spawn commercial start-ups to further develop especially promising inventions. Universities are also not active litigators. As Colleen Chien finds in her empirical study of "high-tech" patent litigation, non-profit entities, of which universities are one element, account for only 1% of the patent infringement plaintiffs.[5] Clearly universities are not what people have in mind as a patent troll, despite their non-practicing status. Indeed, universities might be better considered patent "elves", in that they conduct meaningful research which is then dispersed through the economy via licensing.

[2] The term "patent troll" was coined in the late 1990s by Peter Detkin, then assistant general counsel at Intel but now, ironically, a managing partner at Intellectual Ventures, a firm seen by many as *the* "patent troll" (see discussion below).

[3] Brenda Sandburg, *You May Not Have a Choice. Trolling for Dollars*, THE RECORDER (Jul. 30, 2001), *available at* http://www.phonetel.com/pdfs/LWTrolls.pdf.

[4] Mark Lemley, *Are Universities Patent Trolls?*, 18 FORDHAM I. P. MEDIA & ENTERTAINMENT L. J. 609 (2008).

[5] Colleen Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N. CAROLINA L. REV. 1571 (2008-2009), Table 3. A search of US Patent Office data indicates that at least 1.3% of all granted patents are assigned to entities with "university" in the title. As many universities and their associated labs do not include the word "university" in their titles, the 1.3% figure understates the proportion of patents held by universities. Moreover, the 1% figure reported by Chien includes all non-profits. Hence, it seems safe to assume that universities litigate below their share of patents.

R&D specialists offer another example of a non-practicing entity undeserving of the troll moniker.[6] These firms concentrate on upstream research, typically spending substantial sums on R&D and innovation, but again they do not make things. To economists, these entities are merely exercising their comparative advantage: focusing on what they do best (research and innovation) and ignoring what they do not do well or cannot afford to do at all (commercial production). Semiconductor design houses, so-called fabless chip shops that research and design integrated circuits which are then manufactured by separate fabrication plants, can fall into this category.[7] So do many biotech firms, which emerged after the discovery of recombinant DNA technology in 1973. These firms tend to focus on early stage research and intermediate chemical inputs, leaving time-consuming and expensive drug development and commercialization to larger pharmaceutical companies.[8] These are just two examples of another category of NPE "elves", but a careful examination would reveal R&D specialists in many different sectors throughout the economy.

Instead of profiting from the sale of goods in a downstream market, many R&D specialists profit from licensing the patents on their inventions. Because their profits often depend on a stream of licensing revenues over time, these firms tend to license broadly, diffusing technology and enabling the entry of downstream specialists (e.g., firms without meaningful patent portfolios of their own but wishing to produce goods incorporating the latest technology). Although upstream specialists can certainly be involved in patent litigation (as can any patent holder, whether practicing or not), it is important to understand the repeat-game nature of an upstream invention-based business model: significant R&D investment is followed by patenting and then by licensing, and licensing revenues can often fund the next round of R&D. This repeated cycle can provide a counter balance to incentives for one-shot patent holdup:[9] if firms attempt patent holdup, others in the ecosystem have strong incentives to invent around or avoid their patents in the next iteration of the product, which would eventually dry up the R&D specialists' revenues. Moreover, these firms are not charging a toll for access to something they did not create; they are charging a toll for access to something they did create and for which they are

[6] Damien Geradin, Anne Layne-Farrar & Jorge Padilla, *Elves or Trolls? The Role of Nonpracticing Patent Owners in the Innovation Economy*, INDUSTRIAL AND CORPORATE CHANGE 1 (2011).

[7] *See, e.g.,* Bronwyn Hall & Rosemarie Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979 – 1995*, 32 RAND J. OF ECON. 101 (2001).

[8] Geoffrey Carr, *A Survey of the Pharmaceutical Industry: Beyond the Behemoths*, THE ECONOMIST (Feb. 19, 1998), *available at* http://www.economist.com/node/604094. Carr found that in 1998, roughly 18% of pharmaceutical R&D funds went toward outsourcing.

[9] Hold-up can be a potential problem when successive innovations use the same production facilities, particularly if those innovations make earlier products obsolete. For example, an inventor of integrated circuits may work regularly with fabrication firms that have sunk significant costs into their factories.

entitled to earn a return. Thus, the important distinction for this class of NPE is that licensing fees are not in and of themselves bad – they offer a return on research investments and thus can spur (and fund) more research. Indeed, this is the fundamental rationale for the patent system. Rather, the complaint about trolls is that patent holders should be prevented from exploiting switching costs, the expenses involved when a patent holder unexpectedly appears after a licensee has made its own investments in manufacturing and commercialization that lead to patent holdup.[10]

In light of the many pro-competitive, non-exploitative patent licensing arrangements that do not involve the practice of patents, the Federal Trade Commission coined the term "patent assertion entity", or PAE, in its March 2011 report on IP, "The Evolving IP Marketplace, Aligning Patent Notice and Remedies with Competition".[11] PAEs purchase patents from others (individual inventors, universities, failing firms, firms jettisoning poorly performing divisions, firms selling unneeded assets, etc.) and then seek to "assert" those patents, either through licensing, or more commonly, through litigation. This activity stands in contrast to entities that develop and transfer technology through patent licensing. It is therefore the PAEs that most closely fit the literature's descriptions of patent trolls, although some scholars have written in defense of PAEs as well.[12]

In this article I use the word "troll" when referring to others' use of the word. I use the word "NPE" when discussing the broad category of all non-practicing entities. And I use the term PAE when discussing the narrower subset of NPEs that do not invent themselves but instead focus on litigating patents acquired from others.

The empirical literature on "trolls"

The empirical literature on patent trolls is relatively new and still underdeveloped. Nonetheless, the existing papers that have attempted to quantify the nature and impact of PAEs and their lawsuits are

[10] In short, I equate troll-like behavior with patent holdup. For a discussion of patent holdup, see the Federal Trade Commission Report, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* (Mar. 2011).

[11] This report was the culmination of over a year of investigation by the FTC, which included hearings and workshops held around the country. Another commonly used term is Patent Aggregator, denoting an entity that purchases patents originating with others.

[12] In particular, such entities could operate as "market makers", much like their financial counterparts, creating liquidity and smoothing transactions over IP. *See, e.g.*, James F. McDonough III, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*, 56 EMORY L. J. 189 (2006). For a balanced looks at the pros and cons of trolls, see John Johnson, Gregory K. Leonard, Christine Meyer & Ken Serwin, *Don't Feed the Trolls?*, LES NOUVELLES 487 (2007). While theories on both sides of this debate abound, empirical research is needed to test the various, positive and negative, assertions that have been made about PAEs and "trolls".

instructive. I begin with a paper that attempts to profile PAEs. I then move to the relatively larger set of papers that studies PAE initiated lawsuits.

Feldman and Ewing present a thorough study of the typically secretive operations of PAEs, whom they dub "Patent Aggregators".[13] They report that the first aggregator (at least of noticeable size) emerged in the early 1990s: Acacia Research Corporation was founded in 1993 and went public in December 2002. According to the company's website, "Acacia Research's subsidiaries partner with inventors and patent owners, license the patents to corporate users, and share the revenue. Acacia controls over 200 patent portfolios" spanning a broad array of technologies.[14] Feldman and Ewing report that the firm "has executed more than 1,000 license agreements across 104 technology licensing programs."[15] Despite the numerous license agreements reported by the company on its website, Feldman and Ewing find that Acacia is "among the most litigious of the non-practicing entities."[16] They relay that, "According to one report, the company and its subsidiaries have been plaintiffs in 280 patent lawsuits and defendants (presumably from declaratory judgment actions) in still more litigations."[17]

According to Feldman and Ewing's research, the largest PAE is Intellectual Ventures. Founded by ex-Microsoft executive Nathan Myhrvold, Intellectual Ventures is estimated to hold between 30,000 and 60,000 patents worldwide.[18] However, the firm did not begin to litigate patents directly until quite recently. Instead, it relied on a tactic referred to as "privateering", taking a reference from 18th century warfare. Using its vast, extremely complicated and opaque network of at least 1,276 holding companies and other affiliated entities, Intellectual Ventures would sell a patent to an aggressive non-practicing private party, who would then be free to (and could be expected to) sue any and all potential infringers, while Intellectual Ventures retained a license to the transferred patents for its subscribing members.

Intellectual Ventures apparently changed strategies in late 2010. In December of that year, the company filed three large patent infringement suits in its own name.[19] It has since filed additional suits in other

[13] Robin Feldman & Thomas Ewing, *The Giants Among Us*, 1 STANFORD TECH. L. REV. 1 (2012).
[14] *See* Acacia, About Us, http://acaciaresearch.com/aboutus_main.htm (last visit May 16, 2012).
[15] Feldman & Ewing, *supra* note 13, at 34.
[16] *Id.* at 35.
[17] *Id.* at 35.
[18] *Id.* at 11.
[19] *Id.* at 33.

jurisdictions, including cases before the International Trade Commission. Most recently, it filed suit against AT&T, T-Mobile, and Sprint Nextel in a single lawsuit over fifteen different patents.[20]

With respect to the impact of such litigation, Catherine Tucker studies one particular lawsuit filed by Acacia. The suit asserted two medical imaging software patents and named fourteen distinct defendants.[21] Tucker finds a dramatic short term impact of the litigation on the defendants' investments in new software versions: new releases of imaging software fell to zero for the full set of defendants during the litigation period, despite no change in measured demand (from hospitals) and no drop in textual medical software developed by the same defendant firms.[22]

Bessen et al. study PAE litigation more broadly in their empirical study. They employ a dataset collated by PatentFreedom, "an organization devoted to researching and providing information on NPE behavior and activities", which purports to record litigation instigated by NPEs.[23] PatentFreedom's dataset is private, but the firm's website indicates that it takes a broad definition for its data collection:[24]

> *While it is important to know where NPEs source their patents (i.e., whether the patents were acquired from others or invented by the entity) or other aspects of their modus operandi (e.g., the use of shell companies and a bias for secrecy, etc.), PatentFreedom does not consider these elements in determining whether an entity is classified as an NPE.*

Using this dataset, Bessen et al. find that patent litigation with an NPE plaintiff looks quite different from patent litigation initiated by other entities. In particular, they report that NPE litigation "is focused on software and related technologies, it targets firms that have already developed technology, and most of these lawsuits involve multiple large companies as defendants."[25] This picture is consistent with that presented by Tucker in her study of the Acacia medical imaging software patent lawsuit.

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[20] Posting of Patrick Anderson to Patently-O, http://www.patentlyo.com/ (Feb. 29, 2012).
[21] Catherine Tucker, *Patent Trolls and Technology Diffusion* (Working Paper Series), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1976593 (last visited Mar. 16, 2012).
[22] Of course, this may simply be a rational cost-benefit response to the risks entailed in willful infringement charges. Tucker has not yet examined whether the effects are long lasting, after the litigation concludes.
[23] James Bessen, Jennifer Ford & Michael Meurer, *The Private and Social Costs of Patent Trolls* (Boston Univ. School of Law, Law and Economics Research Working Paper Group, Paper No. 11-45) at 3, *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272.
[24] Patent Freedom, What is an NPE?, https://www.patentfreedom.com/background-npe.html (last visit Mar. 16, 2012).
[25] *Id.* Executive Summary.

In addition, Bessen et al. "find that NPE lawsuits are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010." They note that the broader literature on litigation establishes that defendant lost wealth (damages, lawyer and expert fees, plus market capitalization losses) are generally deadweight losses to society, as relatively little money flows to plaintiffs in comparison with the total loss.[26] Moreover, the authors do not find that defendants' aggregate losses represent transfers to inventors, so they conclude that the "loss of incentives [to innovate] to the defendant firms is not matched by an increase in incentives to other inventors."[27] However, it is important to note that this finding applies only to public NPEs, which is likely to be a small subset of all NPEs.

Even though PAE-centric studies and reports in the popular press may give the impression that PAEs are the only entities filing patent lawsuits,[28] broader academic studies of litigation find that these entities' lawsuits comprise a more modest share of patent infringement litigation than the headlines might suggest. For example, Chien finds that NPEs[29] filed 17% of high tech patent infringement lawsuits between 2000 and 2008.[30] This is a far smaller percentage than the 41% share of patent infringement suits filed by patent-practicing public firms (aka the "giants"). However, when Chien accounts for the fact that NPEs are more likely to file suit against multiple defendants in a single case, where defendants are linked only by their alleged infringement of the NPE's patents (such as in the Acacia case study that Tucker presents), the NPE share jumps considerably, putting NPEs roughly on par with large public firms but still half as much as practicing entities as a group. As a proportion of distinct defendants, Chien reports that NPEs represent 26% of all high-tech plaintiffs, while public practicing firms comprise 30% and private practicing firms comprise 35%. Moreover, Chien finds that lawsuits in certain high technology areas have a disproportionate share of NPE plaintiffs: 39% of infringement cases over computer software or hardware products are filed by NPEs and NPEs brought 40% of the infringement cases over finance-related patents.

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[26] In particular, Bessen et al. cite Sanjai Bhagat & Roberta Romano, *Event Studies and the Law: Part I: Technique and Corporate Litigation*, 4 AMERICAN L. AND ECON. REV. 141 (2002).

[27] Bessen et al., *supra* note 26, Executive Summary. One caveat to the authors' conclusion is that it can be difficult to estimate future deterrence effects. For example, the imposition of such costs on infringers may cause future potential infringers to seek licenses.

[28] *See, e.g.*, Dan Frommer, *Patent Troll NTP Sues Apple, Google, HTC, Microsoft, AND Motorola Over Email Patents*, BUSINESS INSIDER (Jul. 9, 2010) *available at* http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2010/07/09/businessinsider-ntp-sues-apple-google-htc-microsoft-and-motorola-over-email-patents-2010-7.DTL.

[29] She categorizes universities under a separate "non-profit" category, but otherwise does not differentiate between PAEs and upstream specialists.

[30] Chien, *supra* note 5, at 30.

Chien's finding on the technological concentration of NPE lawsuits is corroborated in a study by Michael Risch.[31] Risch finds that most NPE litigated patents fall under the US Patent classifications devoted to communications and computers. Surprisingly, Risch reports that only 8% of the NPE litigated patents in his study fall under USPTO class 705 – the class most closely associated with business method patents. He also finds that chemical and drug/medicine patents are rarely enforced by NPEs. Touching on another aspect of the troll debate, Risch states that "traditional patent quality measures [e.g., patent citations] imply at the very least that NPE patents look a lot like other litigated patents."[32] Despite the similarity of observable patent measures, however, Risch notes that "trolls almost never win infringement judgments."[33]

Given their potential reach, the massive portfolio holdings of some, and the secrecy with which they all appear to operate,[34] it is no surprise that patent "trolls" have captured the attention of scholars and policymakers. But as is discussed next, the patent assertion entities are not the only intimidating creatures in the patent world. Traditional public firms that practice their own patents wield significant heft as well.

Portrait of a "giant"

In the prior era – before the emergence of PAEs, before upstream R&D specialization was practical or even feasible in many sectors, and before universities had created their own patent licensing offices[35] – patents were obtained primarily by manufacturing firms. These were the entities that could afford sustained research efforts, the fruits of which were incorporated into the firm's own products with little to no thought of outside licensing. As significant new business models that were un-tethered to manufacturing emerged, many industry observers appear to have lost sight of the important role that

[31] Michael Risch, *Patent Troll Myths*, 42 SETON HALL L. REV. (2012).
[32] *Id.* at 21. See also, Sannu K. Shrestha, Note, *Trolls or Market-makers? An Empirical Analysis of Nonpracticing Entities,* 110 COLUMBIA L. REV. 114 (2010).
[33] *Id.* at 3. Allison, Lemley, and Walker (2011) come to the same conclusion: they report a win rate for NPEs of 9.2%, compared to 10.7% for the average patent holder. *See* John R. Allison, Mark A. Lemley, & Joshua Walker, *Patent Quality and Settlement among Repeat Patent Litigations*, 99 Georgetown L. J. 677 (2011).
[34] To mention a few others: RPX (a patent defense fund), Round Rock Research (acquired portfolio from Micron Technology), and Transpacific IP Ltd (based in Taiwan and with offices throughout Asia). See Feldman and Ewing, *supra* note 13.
[35] That is, in the late 19th century through much of the 20th century but before the Bayh-Dole Act, the Stevenson-Wydler Act, the Semiconductor Chip Protection Act, the creation of the Court of Appeals for the Federal Circuit, and before landmark cases, like State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998) and Diamond v. Diehr, 450 U.S. 175 (1981), all of which have led to a more IP-focused marketplace.

the large do-it-all firms continued to play. The fact they still hold considerable clout over IP in the marketplace was, for a time anyway, forgotten.

But as already noted above, firms that practice their patents are not just the targets of litigation by PAEs, they are actually the most common patent litigators, at least in the high-tech space.[36] This is not surprising, as efforts at licensing patents or protecting products from infringement are often only successful with the threat of IPR enforcement behind them.

Many large manufacturing firms hold massive patent portfolios. Such holdings are useful in a number of respects. First, they aid in establishing détente with other large manufacturing entities: with large IP portfolios on either side of the bargaining table, cross-licensing is the most common outcome and neither party will want to sue the other for patent infringement unless it is deemed the only route to resolving a dispute. Second, patents on non-core technologies can provide practicing firms with a source of additional revenue via licensing. Licensing non-core patents can also diffuse the company's technologies throughout an industry and can spur core product sales to the extent that non-core patents cover inventions that enable or complement core technologies.[37] On the darker side, however, some worry that such patent arsenals in the hands of large incumbent firms can also be used to wipe out emerging competitive threats from smaller rivals that do not have armies of patent lawyers nor the financial resources to amass huge patent portfolios.[38] Threatening patent litigation against smaller competitors can be enough to dry up the entrant's sources of financing.[39]

As an illustration of a patent "giant", consider IBM, the poster child for an old-school manufacturing firm that learned early on to embrace the new world order of IP licensing. According to IBM's website[40]

> *In 2007, IBM received 3,125 U.S. patents from the USPTO. This is the fifteenth consecutive year that IBM has received more US patents than any other company in the world. In addition to delivering these innovations through its*

[36] Chien, *supra* note 5.
[37] As an example of this latter effect, Bluetooth technology is licensed royalty free by relevant patent holders because its increased adoption leads to increased sales of high tech goods. See the discussion in Anne Layne-Farrar & Josh Lerner, *To Join or Not to Join: Examining Patent Pool Participation and Rent Sharing Rules*, 29 Intl. J. of Industrial Organization, Issue 2, 294 (2011).
[38] This tactic is referred to as "predatory litigation". *See, e.g.*, Pierre Regibeau & Katherine Rockett, *Assessment of Potential Anticompetitive Conduct in the Field of Intellectual Property Rights and Assessment of the Interplay between Competition Policy and IPR Protection*, (2011), *available at* http://ec.europa.eu/competition/consultations/2012_technology_transfer/study_ipr_en.pdf.
[39] Josh Lerner, *Patenting in the Shadow of Competitors*, 38 J. OF L. AND ECON. 463 (1995).
[40] *See* IBM, Intellectual Property and Licensing, http://www.ibm.com/ibm/licensing/ (last visit Mar. 16, 2012).

products and services, IBM maintains an active patent and technology licensing program.

With continual large accretions made each year, IBM's current patent portfolio consists of around 40,000 active patents.[41] In addition to encouraging firms to license those patents, IBM has also been a regular patent infringement plaintiff. Some suits have been highly controversial, such as when IBM accused a French open source software entity of infringing over one hundred of its patents. [42] In other instances, IBM's litigation fits the traditional mold mentioned above. For example, IBM sued Amazon.com in 2006 only after nearly four years of attempts to resolve alleged infringement issues through negotiations.[43]

Texas Instruments is another giant well known for its relatively aggressive stance on IP. Its patent portfolio size is not far behind IBM's, at around 38,000 patents worldwide, and that count has been growing on the order of 1,000 plus patents each year.[44] And TI has also been on both sides of patent litigation.[45] For instance, in the 1980s TI sued nine Korean and Japanese chip makers in order to increase their royalty payments.[46]

With such vast patent portfolios listed among their assets, it is no wonder that manufacturing giants' patents frequently make their way onto technology markets. And that is just what happened in 2011, when numerous patent auctions, acquisitions, and rights-transfers took place within the wireless sector. The following section describes the flurry of activity occurring in 2011.

The "Great Patent Bubble of 2011"[47]

It all began with Novell. With its efforts at reinvention failing and its earnings steadily declining, the company began to shop its assets in the spring of 2010. As many as 20 entities registered bids to

[41] *See* IBM, Intellectual Property and Licensing – Patents, http://www.ibm.com/ibm/licensing/patents/ (last visit Mar. 16, 2012).
[42] See, for example, the controversy stirred by IBM's assertion of over 100 of its patents against a French open source firm, Posting of Eingestellt von Florian Mueller to Foss Patents (Apr. 6, 2010), http://fosspatents.blogspot.com/2010/04/ibm-breaks-taboo-and-betrays-its.html.
[43] *See* Press Release, IBM, IBM Files Patent Infringement Lawsuits Against Amazon.com (Oct. 23, 2006), *available at* http://www.ibm.com/press/us/en/pressrelease/20481.wss.
[44] *See* TI Factsheet, http://www.ti.com/corp/docs/company/factsheet.shtml.
[45] *See* Andrew Pollack, *The New High-Tech Battleground*, THE NEW YORK TIMES (Jul. 3, 1988), *available at* http://www.nytimes.com/1988/07/03/business/the-new-high-tech-battleground.html?pagewanted=all&src=pm.
[46] Michael Paul Chu, *An Antitrust Solution to the New Wave of Predatory Patent Infringement Litigation*, 33 William and Mary L. Rev., Issue 4, 1341 (1992).
[47] Richard Waters, *Patent Hunting is Latest Game on Tech Bubble Circuit*, FINANCIAL TIMES (Jul. 27, 2011), *available at* http://www.ft.com/intl/cms/s/0/16025f76-b868-11e0-b62b-00144feabdc0.html#axzz1gSKjhuMc.

purchase Novell.[48] Since most of the registering suitors were private equity firms, speculation about a purchase motivated primarily if not solely by Novell's extensive patent holdings began immediately.[49] In the end, a hybrid deal was struck over Novell's assets. On November 22, 2010, Novell announced that it was being acquired by the software firm Attachmate Corporation.[50] However, as part of the deal Novell also made the following announcement regarding its patent portfolio:[51]

> *Novell also announced it has entered into a definitive agreement for the concurrent sale of certain intellectual property assets to CPTN Holdings LLC, a consortium of technology companies organized by Microsoft Corporation, for $450 million in cash, which cash payment is reflected in the merger consideration to be paid by Attachmate Corporation.*

The "certain intellectual property assets" referenced in the announcement were some 882 patents, described as a "treasure trove" by some knowledgeable observers.[52]

The acquisition by Attachmate was consummated in April 2011, but competition authorities at the German Federal Cartel Office and the US Department of Justice (DOJ) questioned the patent portfolio acquisition by the CPTN consortium.[53] Of particular concern was the fact that Novell, once a big player in the Unix operating system and hence important for the open source operating system Linux, had made certain licensing commitments to the open source community. In order to move the deal along while the competition agencies wrestled with the cartel aspects and prior licensing obligations, it was decided – in the words of Open Source Initiative President Michael Tiemann – that "CPTN will now only exist for long enough to distribute the shares equally among the participants in the transaction (no more than three months), and thus will not form a new long-term patent troll itself."[54] The final resolution issued

[48] Matt Asay, *Novell Auction Could Be Patent Troll Bonanza*, CNET NEWS (May 28, 2010 9:04 A.M. PDT), *available at* http://news.cnet.com/8301-13505_3-20006248-16.html. Matt Asay is a former Novell employee.
[49] *Id.*
[50] Press Release, Novell, Novell Agrees to be Acquired By Attachmate Corporation (Nov. 22, 2010), *available at* http://www.novell.com/news/press/2010/11/novell-agrees-to-be-acquired-by-attachmate-corporation.html.
[51] Note that Novell had already entered into a joint patent agreement with Microsoft, so Microsoft held a license to the patents that were sold in 2011. *See* Press Release, Microsoft, Microsoft and Novell Announce Broad Collaboration on Windows and Linux Interoperability and Support (Nov. 2, 2006), *available at* http://www.microsoft.com/presspass/press/2006/nov06/11-02MSNovellPR.mspx.
[52] Asay, *supra* note 48.
[53] Jon Brodkin, Novell Patent Sale to Shield Microsoft, Apple, EMC and Oracle from Lawsuits, NETWORK WORLD (Apr. 8, 2011), *available at* http://www.networkworld.com/news/2011/040811-novell-patents.html.
[54] *Id.*

by the DOJ made two stipulations.[55] First, Microsoft must sell back the Novell patents it acquired through CPTN and can maintain only a license to those patents, which it had acquired prior to the Novell patent sale. Second, all of the patents acquired by CPTN must be made available royalty free for open source licensing.

The next patent auction offered up Nortel's even bigger portfolio. Once "the world's largest supplier of telecom equipment,"[56] Nortel filed for bankruptcy in 2009 but was unable to successfully restructure itself. Two and a half years later, in June of 2011, Nortel began auctioning off its most valuable remaining assets – its patents.[57] Its portfolio consisted of nearly 6,000 patents, including many on wireless, data networking, optical, voice, Internet and semiconductor technologies, with "the most-wanted ones relat[ing] to emerging 4G [wireless] standards such as long-term evolution (LTE)."[58]

With the $450 million price tag from the Novell patent sale still fresh in everyone's minds, the Nortel patent auction spurred far more talk up front than the Novell announcement had. Immediately, big names in the high tech and telecom sectors, including Apple, Ericsson, Google, Intel, Microsoft, and Research in Motion (RIM), expressed their interest in Nortel's patent portfolio.[59] In fact, Nortel delayed the start of its auction by one week to allow it to evaluate additional bids.[60] Google's opening bid of $900 million (twice the Novell price) was selected as the "stalking horse", setting the floor for further bids. Early speculators anticipated that the sale might generate as much as $1 billion. These guesses proved to be woefully conservative.

According to Reuters, Intel started the four-day auction for the Nortel patents with a $1.5 billion opening offer, a 67% premium to the base price set by Google.[61] The bidding went for 19 rounds, concluding in early July 2011. Reminiscent of the Novell patent purchase, a consortium provided the

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[55] Press Release, U.S. Dept. of Justice, CPTN Holdings LLC and Novell Inc. Change Deal in Order to Address Department of Justice's Open Source Concerns (Apr. 20, 2011), *available at http*://www.justice.gov/opa/pr/2011/April/11-at-491.html.

[56] According to Canadian Business' Andrew Wahl, as quoted in John Kelley, *War of Tech Giants Unfolds with Multi-Billion Dollar Patent Auction [Part One]*, PALO ALTO PATCH (Aug. 8, 2011), *available at* http://paloalto.patch.com/articles/war-of-tech-giants-unfolds-with-multi-billion-dollar-patent-auction-part-one.

[57] *See* Julie Triedman, *With Cleary Presiding, Nortel Patent Auction Could Be Biggest Ever*, THE AMLAW DAILY (Jun. 24, 2011), *available at* http://amlawdaily.typepad.com/amlawdaily/2011/06/nortelpatentauction.html.

[58] Dave Goodboy, *Rockstar Wins $4.5b Nortel Patent Buyout*, BEACON EQUITY RESEARCH (Jul. 12, 2011), *available at* http://www.beaconequity.com/rockstar-wins-4-5b-nortel-patent-buyout-2011-07-12/.

[59] Tom Krazit, *Nortel Delays Mobile Patent Auction One Week as Bidders Get Ready*, MOCONEWS.NET (Jun. 16, 2011), *available at* http://moconews.net/article/419-nortel-delays-mobile-patent-auction-one-week-as-bidders-get-ready/.

[60] *Id.*

[61] Kelley, *supra* note 56.

winning Nortel bid. Rockstar Bidco, a coalition of Apple, Microsoft, EMC, Ericsson, RIM, and Sony, won the patent portfolio with its $4.5 billion buyout bid.[62]

Raising analogous concerns over collusion as those that prompted competition agency review of the Novell deal, the American Antitrust Institute wrote to Assistant Attorney General for Antitrust Christine Varney calling for an in-depth DOJ investigation into Rockstar's purchase.[63] It is important, though, to keep in mind the difference in circumstances between the two auctions. Both auctions offered failing firm patent assets for sale, but, unlike Novell, Nortel had no open source licensing encumbrances attached to its portfolio.

The DOJ's decision, issued on February 13, 2012,[64] allowed both consortium deals to go through, relying in particular on commitments made by Apple and Microsoft. Specifically, the two companies committed to license any of the patents relevant for industry standards on fair, reasonable and non-discriminatory (FRAND) terms and not to seek "offensive" injunctive relief – that is, to only seek injunctive relief after an opposing party sought it first. The decision indicates that joint bidding in patent auctions, at least with some assurances of reasonable licensing, is a viable strategy going forward.

The criticisms of the auctions' conclusion were not confined to antitrust allegations of collusion, however. Google also swiftly cried foul over both the Novell and Nortel auctions. Coining the nickname "Micropple" for the Microsoft-Apple led coalitions (first CPTN with Novell, then Rockstar with Nortel), Google complained that these firms (and their cohorts) were "engaged in a 'hostile' patent war against the search giant."[65] David Drummond, Google's Chief Legal Officer, argued on the official Google blog that[66]

> They're doing this by banding together to acquire Novell's old patents (the "CPTN" group including Microsoft and Apple) and Nortel's old patents (the "Rockstar" group including Microsoft and Apple), to make sure Google didn't get

[62] Goodboy, *supra* note 58.
[63] Press Release, AAI, American Antitrust Institute Warns of Anticompetitive Effects from Wireless Technology Consortium's $4.5 Billion Purchase of Nortel's Entire Patent Portfolio (Jul. 6, 2011), *available at* http://www.antitrustinstitute.org/content/american-antitrust-institute-warns-anticompetitive-effects-wireless-technology-consortiums-4.
[64] Press Release, U.S. Dept. of Justice, Statement of the Department of Justice's Antitrust Division on Its Decision to Close Its Investigations of Google Inc.'s Acquisition of Motorola Mobility Holdings Inc. and the Acquisitions of Certain Patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd. (Feb. 13, 2012), *available at* http://www.justice.gov/opa/pr/2012/February/12-at-210.html.
[65] Posting of David Drummond, Sr. to the Official Google Blog, When Patents Attack Android (Aug. 3, 2011), http://googleblog.blogspot.com/2011/08/when-patents-attack-android.html.
[66] *Id.*

> them; seeking $15 licensing fees for every Android [mobile operating system] device; attempting to make it more expensive for phone manufacturers to license Android (which we provide free of charge) than Windows Phone 7; and even suing Barnes & Noble, HTC, Motorola, and Samsung. Patents were meant to encourage innovation, but lately they are being used as a weapon to stop it.

Interestingly, Google had been invited to join the Novell bidding effort with CPTN, but declined to do so.[67] Google pointed out that: "A joint acquisition of the Novell patents that gave all parties a license would have eliminated any protection these patents could offer to Android against attacks from Microsoft and its bidding partners."[68] Of course, a license to the patents for Google, Apple and Microsoft would have prevented any patent "attacks" involving these patents, assuming patent exhaustion or some other pass through of rights to Android-reliant device makers. However, by sharing the license Google would not have obtained an IP club of its own to use against other patent assertions. Thus, one observer opined that:[69]

> …once Google figured out that they wouldn't be the only ones with access to these patents, and that it would basically give them a stalemate, allowing them no leverage over patents gained in [other patent auctions], or elsewhere, it effectively dropped its bid. If it couldn't gain some sort of decisive advantage with the purchase, then it figured it was a waste of money.

It is certainly not surprising that Google would want to amass a patent portfolio of its own. As a "new entrant" among several established large mobile telecom firms, Google is currently more of a wireless telecom "dwarf": it is one of the few firms in the industry without a sizeable patent portfolio. As of early 2011 fewer than 2,000 US patents were under Google's control,[70] including acquisitions of mobile phone related patents that Google had made from the Myriad Group and from Verizon.[71] As discussed above in relation to patent assertion entities, having a portfolio of your own is an important defensive mechanism for patent-practicing firms. Hence Google's interest in Novell's and Nortel's patent portfolios and its disappointment in not acquiring them.

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[67] Matthew Panzarino, *Google Says It Didn't Want Novell Patents If Everyone Got Them [Updated]*, TheNextWeb (Aug. 4, 2011), *available at* http://thenextweb.com/google/2011/08/04/google-says-it-didnt-want-novell-patents-if-everyone-got-them/.

[68] Drummond, *supra* note 65.

[69] Panzarino, *supra* note 67.

[70] Posting of Bill Slawski to SEO by the Sea, Google Patents Updated (Feb. 6, 2011), http://www.seobythesea.com/2011/02/google-patents-updated/. A search of the USPTO database conducted December 14, 2011 found 956 patents assigned to Google, but this count misses the recent reassignments resulting from Google's purchases, as discussed below.

[71] Posting of Bill Slawski to SEO by the Sea, Is Google Now a Phone Company? (Dec. 21, 2010), http://www.seobythesea.com/2010/12/is-google-now-a-phone-company/.

Despite Google's rhetoric following the Nortel auction about "bogus" patents stopping genuine innovation,[72] however, the company has not let its patent auction bidding frustrations deter it from seeking other sources of patent acquisition. Indeed, in late July 2011, Google concluded a purchase deal with IBM for 1,030 patents thought to be relevant for the Android mobile operating system.[73]

That same month, July of 2011, InterDigital – yet another wireless telecom company – announced that it too "was looking at putting itself up for sale: with a market value of $3.2bn even before any auction begins."[74] When the *Wall Street Journal* announced that Google was considering making a bid, InterDigital's share price increased by 15 percent.[75] No deal had been consummated by the end of 2011, however, and Google appears to have shifted its attention elsewhere.[76]

In particular, Google's object of affection turned out to be Motorola Mobility Holdings Inc. (MMI) – Motorola's subsidiary that makes Android smart phones and tablets, among other things. In August of 2011, Google announced its purchase of MMI for $12.5 billion.[77] With the acquisition approved by the competition authorities in February 2012,[78] Google gained control of MMI's 17,000 granted patents, plus its 7,500 pending patent applications,[79] putting it one step closer to achieving "giant" status in the mobile telecom world, adding to its already leading position in trade secret-reliant internet search.

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[72] Drummond, *supra* note 65.

[73] Jolie O'Dell, *Google Buys 1,030 IBM Patents, Girding Its Loins for Android Lawsuit*, VENTURE BEAT (Jul. 29, 2011), http://venturebeat.com/2011/07/29/google-ibm-patents/.

[74] Waters, *supra* note 47.

[75] Posting of Shira Ovide to Wall Street Journal Blogs, *Meet Google's Latest Takeover Target: InterDigital* (Jul. 20, 2011), http://blogs.wsj.com/deals/2011/07/20/meet-googles-latest-takeover-target-interdigital/.

[76] Due to lack of interest, InterDigital withdrew its sale offer in late January 2012. *See* Michael J. De La Merced, *InterDigital Calls Off Patent Sale*, THE NEW YORK TIMES (Jan. 23, 2012), available at http://dealbook.nytimes.com/2012/01/23/interdigital-said-to-call-off-patent-sale/.

[77] Sayantani Ghosh, *InterDigital skids after Google goes for Motorola Mobility*, REUTERS (Aug. 15, 2011), *available at* http://www.reuters.com/article/2011/08/15/us-interdigital-shares-idUSTRE77E3FA20110815.

[78] The European Commission delayed the acquisition on December 12, 2011, citing the need for additional documents. *See* James Kanter, *Google Acquisition of Motorola Delayed in Europe*, THE NEW YORK TIMES (Dec. 12, 2011), http://www.nytimes.com/2011/12/13/technology/google-acquisition-of-motorola-delayed-in-europe.html. On February 13, 2012 – the same day the DOJ approved the Novell and Nortel acquisitions – the EC approved Google's MMI deal, albeit somewhat reluctantly, stating that it would keep a close eye on the company. *See* Diane Bartz & Foo Yun Chee, *Motorola Mobility, Google Deal Gets EU Nod*, REUTERS (Feb. 13, 2012), *available at* http://www.chicagobusiness.com/article/20120213/NEWS08/120219944/motorola-mobility-google-deal-gets-eu-nod.

[79] "Google fits the mold of a company at which revenue growth has outpaced its ability to generate its own patents and therefore has been forced to buy aggressively until its internal efforts catch up." Mike McLean, *Google and Motorola - A Match Made in Patent Heaven?*, UBM TECHINSIGHTS – EDN (Sep. 15, 2011), http://www.edn.com/article/519354-Google_and_Motorola_A_match_made_in_patent_heaven_.php.

Not to be left out, Nokia joined the "patent bubble" in the fall of 2011. On September 1, 2011, Mosaid – a firm that "licenses patented intellectual property in the areas of semiconductors and communications technologies, and develops semiconductor memory technology"[80] – announced that it had acquired 1,200 Nokia "Standards-Essential Wireless Patents and 800 Wireless Implementation Patents".[81]

The details of the Nokia deal are different, and more convoluted, than the earlier 2011 mobile patent acquisitions. In particular, while the patents were all filed by Nokia, they are held by Core Wireless Licensing, a Luxembourg company. Under the terms of the deal, Core Wireless became a wholly owned subsidiary of Mosaid, but did not transfer the patents to Mosaid. Nor did Mosaid pay directly for the Core Wireless acquisition, but instead announced that it "will fund its acquisition of the portfolio through royalties from future licensing and enforcement revenues."[82] Mosaid, through Core Wireless, will only receive one third of any "licensing and enforcement revenues", however.[83] Nokia and, in an interesting twist, Microsoft will share the remaining revenue.[84] Microsoft entered this deal (which it defines as a "passive economic interest"[85]) through its wide reaching Windows Phone collaboration deal struck with Nokia in the spring of 2011.[86] This arrangement could be characterized as Mosaid operating as a type of collections agent on behalf of Nokia and Microsoft, taking a one third cut of any licensing or litigation proceeds.

This last of the many wireless telecom patent deals of 2011 could have far reaching implications. According to Mosaid, 1,200 of the Nokia patents and applications "have been declared essential to second, third and fourth-generation communications standards, including GSM (Global Systems for Mobile communications), UMTS / WCDMA (Universal Mobile Telecommunications Service / Wide-Band Code Division Multiple Access) and LTE (Long Term Evolution)." Hinting at extensive efforts to license and/or litigate this portfolio, Mosaid's press release went on to state that "Based on its extensive

[80] Press Release, Mosaid, MOSAID Acquires 1,200 Nokia Standards-Essential Wireless Patents and 800 Wireless Implementation Patents (Sep. 1, 2011), http://www.mosaid.com/corporate/news-events/releases-2011/110901.php.
[81] *Id.*
[82] *Id.*
[83] Chris Velazco, *Mosaid Acquires 2,000+ Nokia Patents, Will Handle Licensing & Litigation For A Cut*, TECHCRUNCH (Sep. 1, 2011), http://techcrunch.com/2011/09/01/mosaid-acquires-2000-nokia-patents-will-handle-licensing-litigation-for-a-cut/.
[84] *Id.*
[85] Mary Jo Foley, *Microsoft Weighs in on Mosaid-Nokia Patent Deal*, ZDNET (Sep. 2, 2011), http://www.zdnet.com/blog/microsoft/microsoft-weighs-in-on-mosaid-nokia-patent-deal/10523.
[86] Mary Jo Foley, *Microsoft and Nokia Finalize Their Windows Phone Collaboration Agreement*, ZDNET (Apr. 21, 2011), http://www.zdnet.com/blog/microsoft/microsoft-and-nokia-finalize-their-windows-phone-collaboration-agreement/9255?tag=content;siu-container.

experience in the industry, MOSAID believes that revenues from licensing, enforcing and monetizing this wireless portfolio will surpass the Company's total revenues since its formation in 1975."[87] In 2011, Mosaid reported revenues of $80 million (Canadian dollars), so it is expecting a substantial return indeed on its purchase.

As for Mosaid's choice between licensing and litigation, litigation seems the more likely route. Mosaid has a history of filing patent infringement lawsuits, with previous suits against ASUSteK, Asus Computer, Canon, Dell, Huawei Technologies, HTC, Intel, Lexmark, RIM, Sony Ericsson, and Wistron – to name a few.[88] According to one industry analyst, "It would be in Mosaid's best interest to play the bulldog and aggressively pursue not only licensing opportunities, but hefty settlements against companies that infringe on the Nokia patents. Meanwhile, Nokia benefits from whatever Mosaid manages to bring in, but without looking like they're going on a wild suing spree."[89]

Which brings us to the next section, summarizing the mobile patent-related litigation taking place in 2011.

The Mobile Legal Battlefield

Why spend such significant resources on acquiring patent portfolios through auctions and other transfers? To enforce them, of course. Table 1 below summarizes the lawsuits with activity in 2011 or 2012. I focus solely on mobile telecom related lawsuits, in line with the patent auctions and acquisitions discussed above, and limit the list to cases with activity in 2011 or Q1 2012, but even with these restrictions the list is extensive.

Table 1: Patent Infringement Litigation in Telecom, Cases Active in 2011, in order of filing

Plaintiff	Defendant	Date Filed	Court & Case No.	Notes
IPCom	HTC	April 2008	German court	HTC accused of infringing IPCom's 2G and 3G patents
HTC	IPCom	November 2008	District Court District of Columbia, 08-CV-1897	Request for declaratory judgment that HTC does not infringe IPCom patents on 2G and 3G wireless standards

[87] Mosaid Press Release, *supra* note 80.
[88] Foley, *supra* note 85.
[89] Velazco, *supra* note 66.

IPCom	T-Mobile	November 2008	German court	Phone maker accused of infringing IPCom's 2G and 3G patents
Nokia	Apple	October 2009	District of Delaware, 1:09-cv-00791-UNA	Apple accused of infringing Nokia patents on WiFi, 2G and 3G mobile; settled June 2011
Apple	Nokia	December 2009	District of Delaware, C.A. 09-791-GMS	Countersuit claiming non-essentiality, non-infringement, invalidity of Nokia's patents, alleging Nokia infringes Apple patents; settled in June 2011
Kodak	Apple, RIM	February 2010	ITC, 337-TA-703	iPhone and Blackberry accused of infringing one Kodak patent
Apple	HTC	March 2010	District of Delaware, 1:99-mc-09999; ITC 337-TA-710	ITC ruled in Apple's favor on 2 patents out of 10 covering smartphones
Apple	Kodak	April 2010	ITC, 337-717	Countersuit alleging Kodak is infringing two Apple patents; ITC ruled in Kodak's favor (non-infringement) in May 2011
Oracle	Google	August 2010	Northern District of California, No. C 10-03561 WHA	Google Android alleged to infringe Oracle patents and copyright.
Motorola	Apple	October 2010	District of Delaware, 1:10-cv-00867-UNA	Apple iPhones, iPads, iTouches, and some Macs accused of infringing
Apple	Motorola	October 2010	Western District of Wisconsin, 10-CV-662	Countersuit alleging Motorola Android phones accused of infringing 6 of Apple's phone patents
Microsoft	Motorola	October 2010	Western District of Washington, C10-01577-RSM; ITC 337-TA-744	Motorola Android phones accused of patent infringement
Motorola	Microsoft	November 2010	Southern District of Florida, 1:10-CIV-24063; Western District of	Countersuit alleging Microsoft Windows Mobile of patent infringement

			Wisconsin, WI 10-cv- 00699	
VirnetX	Siemens and Mitel	January 2011	Eastern District of Texas 6:11-cv-00018-LED	Defendants internet protocol phones and communications devices accused of patent infringement
Microsoft	Barnes & Noble, FoxConn, Inventec	March 2011	Western District of Washington, 2:11-cv-00343; ITC 337-TA-769	After a year of negotiations, Microsoft sued B&N's Nook and its manufacturers FoxConn and Inventec for infringing Android patents
Apple	Samsung	April 2011	Norther District of California, 11-CV-01846-LHK plus cases filed in 13 other countries	Samsung's Galaxy phones and computer tablets alleged to infringe Apple's trade dress, trademarks, and utility and design patents
Samsung	Apple	April 2011	Courts in South Korea, Japan, and Germany	Countersuits alleging Apple infringes Samsung's mobile standards patents
Ericsson	ZTE	April 2011	Courts in the UK, Italy, and Germany	After protracted licensing negotiations failed, Ericsson sued ZTE over its
ZTE	Ericsson	April 2011	Chinese State IP Office (SIPO)	Countersuit alleging Ericsson infringes ZTE patents on 2G and 4G mobile standards
Huawei	ZTE	April 2011	Courts in Germany, France, and Hungary	ZTE phones accused of infringing Huawei trademarks and patents on data cards and the 4G mobile standard
ZTE	Huawei	April 2011	SIPO	Countersuit alleging Huawei's 4G patents
InterDigital	Huawei, Nokia, ZTE	July 2011	District of Delaware 1:2011cv00654	Patent infringement on 3G phones, USB sticks, mobile hotspots and tablets
VirnetX	Apple	November 2011	Eastern District of Texas, 6:2011cv00563	Apple iPads, iPods, and iPhones alleged to infringe VirnetX patents
Intellectual	AT&T, T-	February 16,	U.S. District Court	Patent infringement on wireless

Ventures	Mobile, and Sprint Nextel	2012	of Delaware, 1:2012cv00193	services.

Source: Author compilation.

The first striking element of Table 1 is its sheer size. Twenty-four lawsuits are listed. Even if we consolidate countersuits with the original suit, there are still at least 16 patent-related lawsuits involving mobile telecomm that were active in 2011 – Q1 2012.

The second striking element is the prevalence of the relative newcomers to mobile telecomm – the "dwarves". Apple is named in 10 of 24 rows above; Google is named in another four, through "proxy fights" against the Android mobile operating system;[90] and Microsoft is named in another two.

I argue in the next section that the patent "dwarves" entering the mobile space are the key reason for both the patent bubble and the extensive litigation currently underway.

The Forces behind the Wireless Patent Acquisition and Patent Litigation Bubble

The unprecedented patent acquisition activity taking place in just one year begs the question of what lies behind the "Great Patent Bubble of 2011". As noted earlier, each of the auctions or acquisitions discussed above was related in some way to wireless phones. The likely catalyst of the patent bubble therefore appears to be the changing wireless competitive landscape.

The three new mobile entrants that emerged in the new millennium created a disruption to the ecosystem equilibrium. Microsoft entered the smart phone arena in 2002, with its Windows Mobile operating system,[91] although this platform appears to have had only a minor impact on the industry thus far.[92] In contrast, Apple entered the wireless telecom industry in 2007 with its game-changing iPhone and has steadily amassed share ever since.[93] Google then introduced the Android wireless operating system in 2008, with multiple manufacturers building to it, and it too has rapidly earned share.[94]

[90] Google asserts that the Android OS is open source software, and thus should not be subject to asserted patents. The industry has clearly challenged that position. See Android Open Source, Welcome to Android, http://source.android.com/.
[91] Chris Tilley, *The History of Windows CE Humble Beginnings*, HPC FACTOR (Feb. 18, 2001), http://www.hpcfactor.com/support/windowsce/.
[92] Brian X. Chen, *Nokia's Windows Phones Get a Good Start in Europe*, THE NEW YORK TIMES (Feb. 21, 2012), *available at* http://bits.blogs.nytimes.com/2012/02/21/nokia-lumia-europe/.
[93] *See* Brad Cook, *Google Overtakes Apple in U.S. Smartphone Market Share*, THE MACOBSERVER (Jan. 7, 2011), http://www.macobserver.com/tmo/article/google_overtakes_apple_in_u.s._smartphone_market_share/.
[94] *Id.*

These three firms are not fragile start ups – they are established entities, well-funded and well-positioned to compete strongly in the wireless marketplace. What they all lacked in 2011, however, were significant patent portfolios specific to the wireless space. When seen in this light, Apple's, Microsoft's, and Google's scramble to acquire patents, and each entity's efforts to prevent the other from doing so, is economically understandable, even with the multi-billion dollar portfolio price tags. Once the new entrants' desire to acquire wireless-relevant patents became known through the price garnered by the Novell auction, other entities with more wireless patents than cash were on notice and the bubble began to expand.

Wireless ecosystem sales opportunities are huge. Globally, in the fiscal year running from April 2009 to March 2010, wireless network operators earned in the aggregate over $300 billion in revenues, with four operators earning $50 billion each.[95] In 2011, wireless device sales generated $61.5 billion in revenues.[96] But network revenues and handset sales are not all that is at stake: important ancillary opportunities for the wireless platform, such as mobile search, mobile payments, and app sales, are key as well. It is only natural, then, that the competitive battle would have spilled over from the product marketplace to the technology licensing marketplace and to the courthouse.

Thus, the spate of Apple, Google, and Microsoft related patent lawsuits fits within the "market disruption" picture as well. The patent auction and acquisition activity make it clear that eventually all three entrants will have significant wireless-specific patent arsenals of their own. The early years (2011-2012), however, is when these "dwarves" are at their most vulnerable to patent litigation from each other and from the industry "giants" – the more established wireless players who already have a large portfolio of patents essential for the wireless telecom standards and who compete directly with the Apple, Android, and Windows wireless platforms in the downstream marketplace.

Seen in this light, one way to view Table 1 is from a competition economics standpoint. As established in the theoretical economics literature, vertically integrated firms can have incentives to raise their downstream rivals' costs; litigation over upstream patent holdings can be one route to do so.[97] Viewing

[95] BP Tiwari, *Global Wireless Data Update, Quarterly Wrap-up : Q1,2010*, BEYOND4G, http://www.beyond4g.org/wp-content/uploads/2010/08/Mobile-Data-Wrapup-Q1-20101.pdf (last visited March 16, 2012).
[96] Marketsandmarkets.com, *Wireless Platforms Market - Global Forecasts and Analysis* (2011 - 2016) (Jan. 2012), http://www.marketsandmarkets.com/Market-Reports/wireless-platforms-market-535.html.
[97] *See* Anne Layne-Farrar and Klaus M. Schmidt, *Licensing Complementary Patents: 'Patent Trolls', Market Structure, and 'Excessive' Royalties*, 25 *BERKELEY TECH. L. J.* 1121 (2010). *See also*, Klaus M. Schmidt, *Complementary*

the table through an IP lens, however, simply indicates that newcomers to an IP-heavy industry cannot avoid clashes with incumbents: patent licensing (or litigation when licenses are not easy to negotiate) appears to be part of the industry entry fee.

This being said, there seems to be little reason to expect long-lasting patent auction or patent litigation activity related to mobile telecom. If the current dust-up is indeed simply a marketplace reaction to new entrants, then the ecosystem will eventually settle down – at least until the next disruptive event occurs.

Concluding Thoughts

Looking beyond mobile telecom, what broader lessons can we learn from the exciting events of 2011?

It seems clear that the emergence of patent assertion entities has forever changed the way everyone – whether practicing entity or not – views patents. The assertion and the practice of patents appear to have been irrevocably split. This distinction was intentional in the creation of US patent laws,[98] but the levels of separation seen today appear unprecedented.

This fact comes with a number of consequences. Among them is a considerably increased notion of patent value: it's hard to imagine a patent auction yielding multi-billion dollar price tags in the era before PAEs came to fame. Indeed, absent the increased separation of patents and their practice, new wireless entrants may not have been able to enter the industry at all without first amassing patent portfolios of their own. This requirement would have increased the cost of market entry considerably, and would surely have delayed entry to the detriment of consumers.

Following from market entry considerations, fungible and enforceable patents in the hands of non-practicing entities have already had a positive impact on market structure and competition in several areas of the economy, like semiconductors as noted above.[99] These effects will likely continue to unfold.

Patents and Market Structure (Working Paper Series) (Aug. 19, 2009), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1311129.

[98] As patent law makes clear, "The Inventor Is Not Required to Reduce the Invention to Practice"; see Section IV of the US PTO Manual of Patent Examining Procedure, 8th Ed., *available at* http://www.uspto.gov/web/offices/pac/mpep/documents/2100_2137_01.htm.

[99] For other examples, see Geradin et al. *supra* note 6.

Another consequence appears to be increased litigation: it is doubtful that unenforceable patents have much value, regardless of the innovative content of the underlying patented technology. That means litigation is an important tool for all patent holders: giant against giant with a focus on preventing direct rivals from copying key technologies and thereby stealing sales, giant against dwarf with the goal of restricting entry or softening competition, or NPE against practitioner with a focus on establishing reasonable royalties for the authorized use of patented technology.

Moreover, as the above list of possible patent litigation motives makes clear, patents can be forces for good (reduced entry barriers, increased innovation, prevention of free riding, etc.) or evil (holdup, raising rivals' costs, market foreclosure, etc.). What matters for a good versus evil determination is not who holds the patents, but rather how those patents are used. NPEs and practicing entities alike can practice anticompetitive patent assertion strategies. As a result, the key, in my view, is whether holdup is profitable and possible for the patent holder, whichever business model it might follow.

It also seems clear that we should not focus too heavily on patent litigation itself, as opposed to patent holdup. As noted above, patent rights are essentially meaningless unless they can be enforced. This is why we see trolls, giants and dwarves – plus other business models not identified here – engaged in patent litigation. Patent litigation may indeed have social costs, as Bessen et al. argue, but it is difficult to see how we might reduce those costs without killing the many benefits associated with enforceable patent rights.

In the wake of the 2011 patent reform legislation (the America Invents Act of 2011), however, PAE litigation practices may be dramatically altered.[100] The Act prevents plaintiffs from naming multiple unrelated defendants to a single patent infringement case. This will raise the cost of pursuing numerous defendants because each defendant will require a separate lawsuit. This change could also curb the damages awarded to PAE plaintiffs in any one suit because it affects patent holder leverage and the ability to play one defendant off of another. As a result, the Act could (eventually) reduce PAE patent infringement litigation activities, especially in light of the empirical studies that find NPEs have lower odds of winning patent infringement cases.[101]

[100] Leahy-Smith America Invents Act, signed into law by President Barack Obama on September 16, 2011.
[101] *See* Allison, Lemley & Walker*, supra* note 33.

As for the giants, they appear to be increasingly embracing the full range of possibilities embodied in their patent portfolios – beyond patents' use in cross licensing other practicing entities. It is unlikely that that genie will be put back in the bottle.

Finally, which consequences endure and which will fade also depends at least to some degree on the extent to which competition agencies see fit to intervene. As noted above, the US DOJ and the EU Commission both closely examined the two joint patent acquisitions and Google's purchase of MMI, although all three transactions were ultimately cleared. Competition agencies around the globe have for many years now also taken an active interest in IP that relates to cooperative industry standard setting.[102] We have yet to see agency interest in patent "trolls" outside of industry standards, but it is not unthinkable. With the green light given to joint patent auction bidding, we might see proposals for joint patent licensing, where non-practicing patent holders join together for the licensing of their patents – not in a patent pool, which would surely run afoul of competition authorities given the high likelihood of substitute technologies, but rather to consolidate the transaction costs of licensing and enforcing patents, analogous to university technology transfer offices or the music collection societies like ASCAP.

Given the complexity of the effects of NPEs, PAEs, and tradable patent rights on the economy, at least one thing does seem certain: the debate over patent trolls will continue to rage. Before anything conclusive can be said, however, more empirical analysis is needed to bring clarity to the debate. We need to understand the impact of "troll" behavior not just on their lawsuit targets and on public NPEs, but more broadly on individual inventors, small private firms and start ups (collectively the "hobbits" perhaps?), as well as large practicing entities (both dwarves and giants). We have seen hints that each of these entities has responded to the PAE business model with changes in their own practices, so each of these parties needs to be better understood before we can claim to have a complete picture of the Brothers Grimm book of business models.

[102] For the latest example, see the current investigation of Samsung by the European Commission, Press Release, European Commission, Antitrust: Commission Opens Proceedings Against Samsung (Jan. 31, 2012), http://europa.eu/rapid/pressReleasesAction.do?reference=IP/12/89.

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