

## INNOVATION AND THE INVENTION GAP: THE NEED FOR A NEW INVENTION ECONOMY

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### INTRODUCTION

There is a business risk that can destroy small businesses, will burn through cash from multinationals, and should concern everyone who invests in technology. You probably have never heard of it; companies do not maintain balance sheet reserves for it; it does not get described in financial statement risk factors; executives do not talk about it; and there is no single fix to make it disappear.

That risk is due to the *invention gap*—the difference between the inventions a company uses and the inventions for which it has necessary rights.

The invention gap has the potential to unleash serious litigation, not just nuisance suits, resulting in unanticipated disruption of business operations and results. The invention gap can lead to injunctions preventing a company from selling its product inside a country or to trade restrictions preventing the import and sale of a company's products across national borders. The invention gap can enable a complacent company's competitors to build a legal fortress around critical technology components.

The invention gap not only represents risk to companies through competitive behavior and litigation; it represents lost opportunities for entrepreneurs and small businesses that may have an invention surplus. Many inventions are created by individuals associated with small companies, and the rights to those inventions are held in small portfolios. Misunderstanding and mismanaging the invention gap contributes to inefficiencies in the invention economy.

Thus far, companies' efforts to address the invention gap have been ineffective at best and counterproductive at worst. Business strategies applied by many executive decision makers tend to be antiquated and reactionary. Furthermore, efforts by some companies to address their invention gaps by changing the laws about invention rights are likely to minimize

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incentives for inventors, to decrease innovation, and to reward manufacturing prowess disproportionately over inventiveness.

This Essay aims to improve understanding about the invention gap. To do so, Part I discusses invention incentives. Part II explains the evolution of invention gaps. Part III discusses several risk mitigation strategies used by companies. Part IV addresses the inadequacies of relying on litigation to solve the invention gap problem. Part V advocates for the development of an invention economy that can add certainty, increase efficiency, and decrease unmanaged risk exposure for technology manufacturers while increasing competition among them and ensuring more equitable distribution of profits to inventors.

## I. INVENTION INCENTIVES

Advancements in technologies that improve commercial productivity and consumer quality of life are made possible by the vision of inventors. Some inventors are well-known and lauded, while others toil namelessly in nondescript labs. Though some inventors are employed by technology manufacturers and incented by receiving salaries and benefits, the vast majority of inventors are incented by the potential of monetizing their inventions by use of the patent system. For more than 200 years, the U.S. patent system has been wildly successful in encouraging invention and innovation.

Today, the patent system is fundamentally unchanged since the days of Jefferson, when society began awarding patents to the winners in an ongoing race to invention. The first inventor to file a patent application can obtain a patent, which grants her a period of exclusivity to make, use, or sell her invention. The exclusivity allows the inventor to charge rent, or a license fee, to others who make, use, or sell the invention. In exchange for the exclusivity, a patent requires the disclosure of the invention—how it is made, what it does, and how others can copy it. In this way, the system balances protecting the inventor through exclusivity with protecting society through disclosures.

The race to invent and the incentives of our patent system have helped fuel economic opportunity in technology sectors and fostered worldwide improvements in productivity and quality of life. It is the race to invention that gave us the latest tablet computers, gaming consoles, and e-readers—not to mention advancements in treating infectious disease, combating the growing global food crises, and decreasing the adverse impact our growing population has on our planet's health.

## II. CREATION OF AN INVENTION GAP

Despite its success, the patent system faces several challenges. The challenges are largely due to several factors: speed of innovation, the global

nature of the invention market, convergence of inventions from different technology areas into single products, and the distribution of inventors and inventing institutions worldwide. In this environment, most technology companies use an enormous number of inventions in their products and services. These companies, however, typically have the rights to only a small fraction of these inventions. It is the difference between these two—the use of several inventions, and obtaining the right to use only a subset of these inventions—that creates a company’s invention gap. It is important to note that the invention gap is not a normative claim; it is entirely descriptive. Technology companies’ invention gaps are an inevitable byproduct of the nature of the inventive process, competitive pressure in the marketplace, and the administrative realities of our current patent system.

#### A. *Invention Is Incremental and Distributed*

To address the invention gap, it is important to first understand the nature of invention. We tend to think of invention as a single “light bulb” moment in which someone changes the world forever. Single-inventor, fundamental inventions do happen, but only rarely. Even the light bulb invented by Edison was an improvement upon previous inventions and the existing knowledge of the scientific community.<sup>1</sup> Edison even based his invention in part on a patent he bought from two inventors of a previously patented light bulb, Henry Woodward and Mathew Evans.<sup>2</sup> The vast majority of inventions are built on ideas and disclosures from previous inventions. Whether famous or not, nearly all inventors make their advances through iterative and incremental invention. It is only through the combined efforts of hundreds of thousands of inventors over several decades that our modern world is possible.

One highly accessible example of the incremental and convergent nature of the invention is the car dashboard. In 1909, the first oil gauges were incorporated into car dashboards.<sup>3</sup> Today, a century later, dashboards have changed markedly—aggregating a variety of significant features, such as GPS, satellite radio, heated seats, intermittent wipers, backup cameras, cruise control, and push-button wireless communications. Each feature rep-

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<sup>1</sup> See DONALD CARDWELL, *WHEELS, CLOCKS, AND ROCKETS: A HISTORY OF TECHNOLOGY* 350 (1995) (“It was familiar knowledge that the greater the current flowing through a high-resistance wire, the more incandescent the heated wire became.”); see, e.g., *Electric Lamp*, U.S. Patent No. 223,898 (filed Nov. 4, 1879) (describing prior art); *The History of the Incandescent Lightbulb*, ABOUT.COM, <http://inventors.about.com/library/inventors/blight2.htm> (last visited Apr. 6, 2014); see also *The Incandescent Lamp Patent*, 159 U.S. 465, 470-71 (1895) (discussing some of the prior art to Edison’s invention in a patent infringement lawsuit against Edison by a prior patentee of an incandescent light bulb).

<sup>2</sup> JOHN MELADY, *BREAKTHROUGH!: CANADA’S GREATEST INVENTIONS AND INNOVATIONS* ch. 4 (2013); see also LARRY J. KRICKA, *OPTICAL METHODS: A GUIDE TO THE “-ESCENCES”* 99 (2003).

<sup>3</sup> MICHAEL L. BERGER, *THE AUTOMOBILE IN AMERICAN HISTORY AND CULTURE* 412 (2001).

resents hundreds, if not thousands, of incremental inventions. And, while consumers can see the incremental visual and feature improvements of their dashboards, thousands of incremental inventions are unseen by anyone but the most technical engineers. Whether seen or unseen, however, each is a necessary component of the appreciable changes.

Not only is invention incremental, but inventors are distributed around the world, and many inventors hold small portfolios of patent rights. Figure 1 demonstrates patent ownership distribution in areas we think of as “high tech”—that is, patents in areas related to semiconductors, processors, and systems enabled by them, including software.<sup>4</sup>

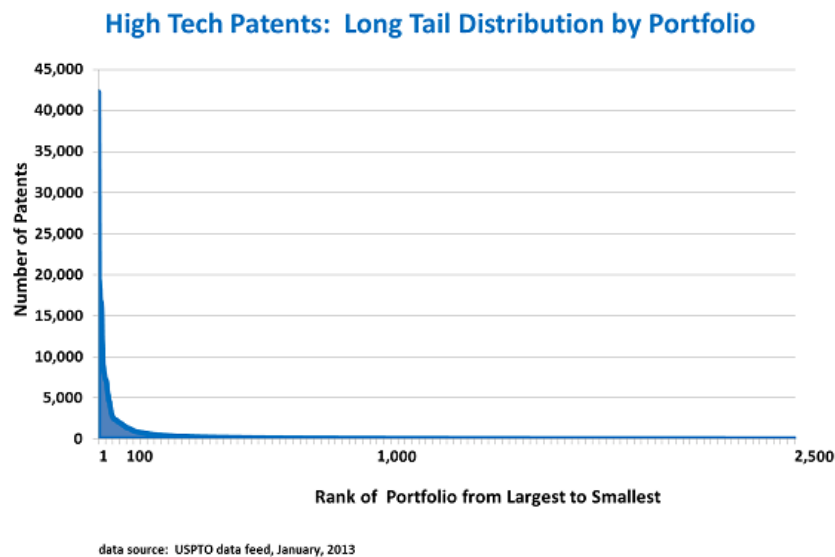


Figure 1: High-Tech Patent Ownership Distribution

There are over 2,500 distinct portfolios of these high-tech patents, comprising nearly 850,000 U.S. patents.<sup>5</sup> While there are fewer than 40 portfolios that hold more than 5,000 patents, there are more than 1,400 port-

<sup>4</sup> In order to determine the universe of high-tech patent portfolios, colleagues at the Author’s company identified over 6,000 U.S. Patent and Trademark Office (“USPTO”) classification codes believed to be relevant to these technology areas and industry segments commonly considered to be high tech. The list of the USPTO classification codes used in this analysis has been provided by the Author to the original publisher of this Essay. To determine how the patents in these class codes were distributed among various portfolios, the Author’s colleagues utilized proprietary name-folding software to match patents to patent portfolios. The underlying data is from the USPTO patent database. See *Patent Full-Text Databases*, U.S. PATENT & TRADEMARK OFF., <http://patft.uspto.gov/> (last visited Apr. 6, 2014).

<sup>5</sup> *Id.*

folios with fewer than 50 patents each.<sup>6</sup> These smaller portfolios are commonly owned by individuals and small businesses.

The number of invention rights that result from incremental invention, coupled with the distribution of invention rights across thousands of portfolios, contributes to the difficulty that technology companies face when they attempt to gain access to all the invention rights they need. In fact, the combination of incremental invention, which creates scale, and the wide distribution of invention rights, which creates sourcing difficulties, makes it nearly impossible for any company to attain the right to practice all of the inventions it actually uses.

### B. *Patent Pendency Fuels Invention Gaps*

While the nature of incremental and distributed inventions contributes to the creation of the invention gap, there is a further complicating factor: delay at the patent office. Patent pendency at the U.S. Patent and Trademark Office (“USPTO”) creates two to four years of delay.<sup>7</sup> This delay is critical because the race to invent creates a winner-take-all situation. For instance, if engineers for a technology company are not the first to file for invention rights, or do not otherwise disclose their inventions in such a way as to create anticipatory prior art, then critical invention rights may be awarded to later-in-time inventors.<sup>8</sup> Those invention rights may be hidden across hundreds or thousands of portfolios. Often, technology companies join a race that has already started in laboratories and start-ups across the world and have little chance of winning or knowing who is winning. But, due to patent pendency, even for invention races being run simultaneously, no one will know who has won the race until years after everyone crosses the finish line.

The disparate invention races, combined with the delays at the patent office, lead to technology companies practicing inventions and accruing profits from those inventions without knowing who owns the underlying invention rights. Some companies pursue a patent clearance study or obtain

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<sup>6</sup> *Id.*

<sup>7</sup> This is not a uniquely modern problem. In 1926, Justice Oliver W. Holmes Jr. invalidated a patent on the ground that “delays of the patent office” in reviewing a patent application did not change the fact that the patentee “was not the first inventor.” *Alexander Milburn Co. v. Davis-Bourmonville Co.*, 270 U.S. 390, 401 (1926). This was relevant insofar as the first inventor had a pending patent application when the second inventor filed his patent application, although the second inventor could not have known about the first inventor’s patent application given that it was secret. *Id.* at 399. The *Alexander Milburn* decision was later codified by Congress in Section 102(e) of the 1952 Patent Act, which is referred to among patent lawyers as holding inventors accountable to “secret prior art.” ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 424 (4th ed. 2007).

<sup>8</sup> 35 U.S.C. § 102 (2006).

a freedom-to-operate opinion for assurance that a new product or service does not have an invention gap. However, to be effective, the clearance or opinion would need to be updated weekly as new patents issue, as long as the patent office continued to issue patents with filing or publication dates that precede the date of the clearance.

Legal risks for infringement further complicate the ability of technology manufacturing companies to actually attain patent clearance or freedom to operate. For instance, if an ongoing clearance effort unearths one or more patents that might be infringed after a company begins incorporating the inventions covered by those patents into its products, the company may risk treble damages for willful infringement if the company remains unlicensed.

### III. RESPONSES TO THE INVENTION GAP

The factual and legal factors that cause the invention gap may lead a manufacturing company to conclude that efforts to solve its particular invention gap may be unrealistic. Instead, the company may pursue a variety of business or legal measures to mitigate its invention gap. The approaches are wide-ranging, such as: ignoring the problem and hoping it goes away, obtaining more patents, cross licenses, and litigating or lobbying to weaken patent rights. Each method, however, has weaknesses. While some companies may pursue two or more of the following strategies in parallel, the strategies are described separately below for clarity.

#### A. *Ignore the Problem and Hope It Goes Away*

Some companies, particularly those that are relatively young or have yet to become successful, address their invention gap by pretending they do not have one. Some CEOs mistakenly believe that without conducting industrial espionage, copying competitors, or engaging in other nefarious activity, there is no patent infringement. This belief ignores the fundamental point of the patent system—to reward inventors who first invent, file patents, and disclose their inventions to the public.

Another important factor is the negative impact that this see-no-evil approach has on *investors* in small or large technology companies, as it introduces potentially undisclosed risk of costly injunctions and litigation. Invention gap risk, though highly predictable, is often not listed on balance sheets and not discussed by senior management in filings available to investors. Choosing to ignore the problem may expose investors to a significant, negative, undisclosed financial risk.

Finally, ignoring the problem puts small businesses and other technology rights holders in a difficult position. Those with legitimate rights to the technology in question may be forced to assert their rights in the court sys-

tem if they are ignored. As discussed below, the litigation process is time consuming and costly for all parties.

### B. *Obtain More Patents*

Some technology companies first respond to awareness of an invention gap by filing and/or purchasing more patents, but each of these approaches has problems. First, to the extent that a company's engineers are the first to invent/file patent applications, the "patent-more" strategy is laudable but inadequate. Unless the company's engineers win *all* of the invention races, there will still be an invention gap. Even more important for today's high-tech companies, the more complex the company's products are, the higher the likelihood that other inventors will win many of the races.

Second, some companies try to solve their invention gap by purchasing patents from others, as opposed to merely attempting to patent more. Google, for example, cited Motorola Mobility's patent portfolio as a key reason why Google acquired Motorola in 2011 for \$12.5 billion.<sup>9</sup> But simply purchasing more patents has shortcomings. The cost of continuously searching all the world's inventions to find, vet, value, and buy inventions is quite costly. Moreover, this costly process essentially lets others free-ride on the efforts of the acquiring company. The acquiring company will have incurred costs that its competitors may not. Not unlike the patent-more strategy, the buy-more-patents strategy is impractical and unlikely to fill a significant portion of an ongoing invention gap.

### C. *Cross Licenses*

Since the 1990s, when Marshall Phelps convinced IBM to start licensing its massive patent portfolio to generate enough revenue to float the company until its computer business recovered, many technology companies have looked to cross licensing to solve their most visible invention gaps.<sup>10</sup> When Phelps's team met with another technology company, they pointed out that the technology company needed a license to several patents owned by IBM.<sup>11</sup> Phelps's leadership resulted in the now conventional practice of assertion-based cross licensing by technology companies.

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<sup>9</sup> Chloe Albanesius, *Google Acquires Motorola Mobility: What You Need to Know*, PCMAG.COM (Aug. 15, 2011, 5:09 PM), <http://www.pcmag.com/article2/0,2817,2391140,00.asp>; Larry Page, *Supercharging Android: Google to Acquire Motorola Mobility*, GOOGLE OFFICIAL BLOG (Aug. 15, 2011), <http://googleblog.blogspot.com/2011/08/supercharging-android-google-to-acquire.html>.

<sup>10</sup> MARSHALL PHELPS & DAVID KLINE, *BURNING THE SHIPS: INTELLECTUAL PROPERTY AND THE TRANSFORMATION OF MICROSOFT* 23-24, 31 (2009).

<sup>11</sup> *Id.* at 26-27.

Following IBM's lead on assertion-based licensing, also called "ex post" licensing,<sup>12</sup> many tech companies look for companies that have smaller patent portfolios, assert their patents, and offer to retract the assertion in exchange for a cross license to their respective patents. The licensing agreement may also require a cash transfer payment representing the difference in the respective patent portfolios. The transfer payment typically favors the initiator of the cross license transaction. IBM's licensing program contributed greatly to the expansion of patent filings by technology companies in Asia, as these companies attempted to decrease the amount of transfer payments they were required to make.

For technology manufacturers, cross licensing is a rough but useful means of achieving the appearance of progress regarding invention gaps. Cross licensing allows some technology companies to complacently assert that they are holding patent portfolios solely for "defensive" purposes (i.e., to ward off cross licensing attempts by others). Shareholders of such companies may not appreciate the expense of maintaining this version of IP strategy. In practice, this cross licensing strategy can lead to a Cold War-style standoff between two competitors with approximately equal patent strength, with neither company initiating a cross license discussion due to concerns of mutually assured destruction.

In any event, these cross license transactions are inefficient at best and, for most companies with complex technology-based products, grossly inadequate to address their invention gap. The reason is that the patents held by technology manufacturing companies in a particular product space, individually and collectively, likely represent a small minority of the total patents that make up a potential invention gap.

As an example of the scope of an invention gap with technologically complex products, consider the troubled Canadian smartphone manufacturer Blackberry.<sup>13</sup> As of October 12, 2013, Blackberry had amassed a significant U.S. patent portfolio of about 2,400 patents related to handset technologies.<sup>14</sup> Although this may seem like a significant number, five of Black-

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<sup>12</sup> See, e.g., Alan Devlin, Essay, *Improving Patent Notice and Remedies: A Critique of the FTC's 2011 Report*, 18 MICH. TELECOMM. & TECH. L. REV. 539, 541 (2012) (discussing the FTC's call for regulating what it refers to as "ex post technology licensing").

<sup>13</sup> Will Connors, Dana Cimilluca & Dana Mattioli, *Blackberry Scraps Its Sale*, WALL ST. J. (Nov. 4, 2013, 9:24 PM), <http://online.wsj.com/news/articles/SB10001424052702303482504579177491399001678>.

<sup>14</sup> To estimate the patents that may constitute the universe of handset-related patents potentially relevant to Blackberry, the Author and colleagues at his company analyzed the patent holdings of Blackberry and five of its close competitors listed in the USPTO data feed to define a set of USPTO patent classification codes. The analysis in this estimate was based on the set of USPTO classification codes that contain patents from each at least three of the six companies and constitute the universe of classification codes necessary to account for at least 80 percent of the total patent holdings among the six companies. Based on the list of classification codes, a copy of which has been provided by the Author to the original publisher of this Essay, the Author and his colleagues used proprietary name-folding



berry's major competitors<sup>15</sup> have a combined portfolio of over 21,000 U.S. patents in similar technologies.<sup>16</sup> So, if Blackberry could agree to cross licensing deals with each of its major competitors, it would have the right to practice nearly 24,000 patents in handset-related technologies. But the rest of the world still holds about 365,000 U.S. patents in handset and related technologies, many of which are contained in the long tail of small patent portfolios. Thus, while cross licensing could potentially address a portion of the invention gap for a manufacturing company, this approach still falls far short of solving its invention gap entirely.

#### D. *Attack Patents*

Several technology manufacturing and service companies have pursued a strategy of weakening the patent system, arguing that doing so would have a beneficial impact for those companies and for consumers of their products and services.<sup>17</sup> Some technology-based companies have even proposed eliminating the patent system altogether, arguing that, due to the challenges affecting the current system, it should be replaced by a system where inventions would be free and inventors would receive a paycheck or a prize, rather than rights to their invention.<sup>18</sup>

But this approach has problems, even for the companies advocating it. Even if undercutting the patent system would have a short-term benefit for some companies and today's consumers, manufacturers with the lowest manufacturing costs would ultimately prevail by cutting out all research and development. Consumers of technology would see the pace of invention slow to a crawl as incentives for invention diminished to paltry cash bonuses or plaques. The patent system is a necessary incentive system that promotes speedy innovation and protects the rights of inventors, regardless of political or business connections.

### IV. THE COURT SYSTEM IS INADEQUATE TO SOLVE INVENTION GAPS

The current legal system for determining and enforcing invention rights is inefficient, opaque, and often unfair for key stakeholders. In many

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technology to determine the patents held by Blackberry and its competitors, as well as the number of patents held in portfolios owned by others.

<sup>15</sup> Specifically, the competitors are Apple, HTC, Samsung, LG, and Google.

<sup>16</sup> See *supra* note 4.

<sup>17</sup> See, e.g., *The Case for Change*, COALITION FOR PATENT FAIRNESS, <http://www.patentfairness.org/learn/about> (last visited Apr. 4, 2014).

<sup>18</sup> Catherine Rampell, *Invent a Drug, Win \$1 Million: Should the Government Start Handing out Prizes for Science Breakthroughs?*, SLATE (Jan. 23, 2008, 1:16 PM), [http://www.slate.com/articles/health\\_and\\_science/science/2008/01/invent\\_a\\_drug\\_win\\_1\\_million.single.html](http://www.slate.com/articles/health_and_science/science/2008/01/invent_a_drug_win_1_million.single.html).

cases, companies using inventions may be unable or unwilling to obtain the rights for the inventions used in their products. The courts cannot adequately vet tens—or even hundreds—of thousands of patents owned by thousands of individual and commercial holders. With no efficient means of determining which invention rights are needed and obtaining adequate access to those rights, companies end up with protracted court battles over invention rights and untimely injunctions, which can significantly affect their bottom line.<sup>19</sup>

For individual patentees or small patent holders, the situation may be worse. Many of these inventors have seen their inventions used in products produced by large companies, who profit handsomely as a result. Smaller holders cannot get the big companies to listen to them, as they likely do not present a credible threat of litigation.<sup>20</sup> Court battles can extend for years and cost millions in legal fees that many holders of small patent portfolios simply cannot afford.

Even if they could afford litigation to force a large technology manufacturing company to pay for the use of their inventions, smaller patent holders may be unable to obtain a timely remedy under the current system. There are approximately six hundred U.S. federal district court judges to handle patent issues,<sup>21</sup> and those judges, according to former Chief Judge of the U.S. Court of Appeals for the Federal Circuit Paul Michel, “are severely overburdened and backlogged.”<sup>22</sup>

Because of this, many courts reduce their patent cases to ten or fewer patents. Often, the issues raised in these patent lawsuits are extremely technical in nature, which creates issues for juries and judges who can be overwhelmed with technical terms and details. As a result, the average patent case now lasts three years.<sup>23</sup> Three years of delay and cost is significant considering that patents expire after twenty years. With more than 2 million

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<sup>19</sup> See Ashby Jones, *Apple-Samsung Patent Battle Heads for Next Round*, WALL ST. J. (Aug. 8, 2013, 11:02 PM), <http://online.wsj.com/news/articles/SB10001424127887323838204579001070722801840>.

<sup>20</sup> As one transactional attorney working in the innovation industries remarked at the FTC’s Workshop on Patent Assertion Entities, some “companies out there refuse to talk to anyone, unless they’re sued.” C. Graham Gerst, Partner, Global IP Law Grp., Comments at the Patent Assertion Entities Activities Workshop Hosted by the Federal Trade Commission and the U.S. Department of Justice 112 (Dec. 10, 2012), available at <http://www.ftc.gov/opp/workshops/pae/> (click on “Transcripts”).

<sup>21</sup> There are 677 authorized federal district court judgeships. *Federal Judgeships*, U.S. COURTS, <http://www.uscourts.gov/JudgesAndJudgeships/FederalJudgeships.aspx> (last visited Apr. 6, 2014). About 70 of those judgeships are vacant. *Judicial Vacancies*, U.S. COURTS, <http://www.uscourts.gov/JudgesAndJudgeships/JudicialVacancies.aspx> (last visited Apr. 6, 2014).

<sup>22</sup> *Inside Views: Interview with Chief Judge Paul R. Michel on US Patent Reform*, INTELL. PROP. WATCH (July 14, 2011, 10:17), <http://www.ip-watch.org/2011/07/14/interview-with-chief-judge-paul-r-michel-on-us-patent-reform/>.

<sup>23</sup> *Id.*

active patents in the United States alone,<sup>24</sup> there is a vast potential for legal and commercial gridlock.

Consider the Blackberry example from above. Blackberry's competitors and the rest of the world own about 390,000 patents in Blackberry's areas of commercial interest.<sup>25</sup> For simplicity in this illustration, assume only 3,900 (or 1 percent of the 390,000 patents) arguably cover Blackberry's phones. Assume further that the six hundred federal district judges in the country will each hear one case, involving an average of 7.5 patents per case,<sup>26</sup> to decide whether any of those 7.5 patents is valid, enforceable, and infringed. If each case took two years, it would take over 1,000 case years for the court system to resolve even this relatively small portion of Blackberry's potential invention gap. And to do so would require that over 85 percent of federal judges hear one of the two-year cases. Current rules regarding patent litigation would not allow patent holders to determine disputes regarding the invention gaps of Blackberry's competitors in cases against Blackberry.<sup>27</sup>

The current legal system is inadequate to tackle the invention gaps of thousands of technology manufacturing companies involving hundreds of thousands of patents. Courts are overburdened, and lawsuits are inefficient and cannot be decided quickly and at scale. Companies live under the threat of litigation. Inventors are denied the incentive for their ideas. We need a new approach: an invention economy to bridge the invention gap and create a better system for invention rights.

## V. AN INVENTION ECONOMY

The inadequacies of the current legal system can be significantly remedied through private ordering, market-based mechanisms that make invention rights available for use in products, while providing inventors with incentives to foster innovation. Such an evolving invention economy should meet three criteria: broad access for interested stakeholders, a reasonable amount of transparency, and an efficient way to transact. An effective invention economy would lower barriers to entry for those who hold small portfolios of inventions, attract increased investment, and increase market-based pricing.

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<sup>24</sup> Dennis Crouch, *How Many US Patents Are In-Force?*, PATENTLY-O (May 4, 2012), <http://www.patentlyo.com/patent/2012/05/how-many-us-patents-are-in-force.html>.

<sup>25</sup> See *supra* note 4.

<sup>26</sup> This example assumes that each court would take half a patent in order to illustrate with simple math the inefficiency of the legal system to resolve invention gaps on the order of hundreds of thousands of patents. In reality, the courts would not decide patents disputes in a single case if the patents were held by different owners.

<sup>27</sup> Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 19(b), 125 Stat. 284, 332-33 (2011) (to be codified at 35 U.S.C. § 299(a)).

Some nonpracticing entities (“NPEs”)<sup>28</sup> have drawn criticism for their role in the current patent system, given the existing emphasis on access to the inefficient court system. In an efficient invention economy, as opposed to the legal system, NPEs could serve a market-making function. This should be unsurprising, as market intermediaries have long served this role in other areas of the economy, such as investment banks in the stock market and agency firms in the real estate market.

As a market-maker, an NPE can act as an intermediary between the large number of small, distributed portfolios of invention in the long tail<sup>29</sup> and the manufacturing companies that need access to vast numbers of invention rights for their complex products. In a market-making role, an NPE can provide inventors with reliable incentives for participation in the market. For technology manufacturing companies, a market-making NPE can provide the scale, efficiency, and predictability of a repeat actor in the market needed to address invention rights held in the long tail. Rather than facing the exorbitant transaction costs associated with contacting thousands of individual patent holders and sorting through hundreds of thousands of patents, manufacturers can partner instead with an NPE. As a single market intermediary, the NPE provides a manufacturer with efficient access to packages of invention rights, and as such provides an equally fair and efficient solution to the invention gap.<sup>30</sup>

If innovative market actors are able to create the mechanisms to facilitate an efficient invention economy, such as the market-making function of an NPE, we may reap the rewards promoted by the patent system. We may thus strike the right balance between protecting the incentives of inventors, on the one hand, and enhancing the speed with which manufacturers can incorporate inventions into their products, on the other hand.

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<sup>28</sup> For purposes of this Essay, I will use the term NPE broadly to mean patent aggregators who actively license their portfolios. For a discussion of the limitations of the term “NPE” in describing licensing-based business models, see *Demand Letters and Consumer Protection: Examining Deceptive Practices by Patent Assertion Entities: Hearing Before the Subcomm. on Consumer Prot., Prod. Safety, and Ins. of the S. Comm. on Commerce, Sci., and Transp.*, 113th Cong. 3-4 (Nov. 7, 2013) (statement of Adam Mossoff, Professor, George Mason Univ. Sch. of Law), available at [http://www.commerce.senate.gov/public/?a=Files.Serve&File\\_id=c5cc328a-af61-4f12-bea7-e2ae6fb42ce3](http://www.commerce.senate.gov/public/?a=Files.Serve&File_id=c5cc328a-af61-4f12-bea7-e2ae6fb42ce3) (“Aside from the strange locution of identifying the active commercialization of a property right in the marketplace as ‘non practicing’—it is tantamount to saying that landlords are ‘non-practicing’ owners of their property rights because they do not live on their real estate parcels—this term is applied in inconsistent ways.”).

<sup>29</sup> See *supra* note 4 and accompanying chart.

<sup>30</sup> In effect, the invention gap represents in patent law the same transaction-cost problem in the efficient use of communally owned land that is solved by the creation of private property, as recognized by Harold Demsetz in his famous economic analysis of the evolution of private property rights. See Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. (PAPERS & PROC.) 347, 356 (1967) (observing that “private ownership of land will internalize many of the external costs associated with communal ownership, for now an owner, by virtue of his power to exclude others, . . . [has] incentives to utilize resources more efficiently”).

## CONCLUSION

We have all benefited from the innovative fruits of our patent system. The patent system faces constant challenges, however; in the twenty-first century, the pace of newly invented technology, and its resulting incorporation into new products and services, has accelerated past traditional legal and commercial approaches to solving the invention gap. In our modern innovation economy, a market-making NPE may lower the high transaction costs resulting from legal and commercial gridlock by efficiently bringing together the creators and users of patented innovation. The NPE does this by aggregating, valuing, and packaging invention rights for efficient access by technology manufacturers. By creating an efficient invention economy, we can minimize manufacturing companies' invention gap and restore incentives for invention.