THE FOUR PHASES OF PATENT USAGE

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I. INTRODUCTION

A common trend is observable in consumer, high-technology industries: many companies tend to follow a predictable, four-phase path in their usage of patented intellectual property (IP). The author denominates these phases as "Incubation," "Defense," "Saturation," and "Depletion." They are typically sequential and largely correspond with four stages of a business lifecycle: start-up, growth, maintenance, and decline.[1] Criteria are provided for identifying, within the context of patents, the particular phase in which a company may find itself. Transitions between phases—for example, a pre-Depletion transition period—are also described. Other forms of IP, such as copyrights and trademarks, may require an entirely different analysis than is presented here.[2]

The first three phases—Incubation, Defense, and Saturation—are associated with manufacturing, while the Depletion phase is often defined by a company's status as a non-practicing entity (NPE). It should be noted that NPE status may be obtained by multiple routes, including the following: choice, when intentionally bypassing the first three phases; short-circuit, perhaps due to financial failure or because a new product lacks sufficient marketability to support successful completion of the manufacturer's Incubation phase; and obsolescence, when a

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[1] *See* Susan Saltonstall Duncan, *Staying Ahead of the Curve: Tracking the Trends*, LAW PRACTICE, Oct.–Nov. 2006, at 60, 61 (noting the business cycle).

[2] Mark A. Lemley, *Should Patent Infringement Require Proof of Copying?*, 105 MICH. L. REV. 1525, 1525 (2007) (noting the uniqueness of patent law).

manufacturer's product line ages to the point that it can no longer sustain the Defense or Saturation phase.[3]

As a preview, the widely-touted purpose of the patent system, which is "to promote innovation,"[4] is most likely to be fulfilled to its full potential in the Incubation phase, often somewhat less likely in the Defense phase, and lesser still in the Saturation phase. Patents used in the Depletion phase may be tax-like burdens,[5] either placed on new market entrants by older manufacturers that wish to avoid competition from the current generation of innovators, or placed on most manufacturers (both new and old) by "patent troll" entities practicing ex post assertions against independently-invented products. One potentially useful definition of a patent troll is an entity that demands payment for a patent that is disproportionately high relative to the value of that patent's teaching to the industry, and is neither using the patent to preserve market share for its own unique products, nor is using the patent in a cross-license, so that it can continue to profitably manufacture products for the marketplace.[6] Not every NPE is a patent troll, and not every patent troll is an NPE.

The four various phases may each be defined by a patent owner's primary intended use of patents, or at least by an objectively-defined primary intended use. This can be ascertained by examining the relationship between IP rights (IPR) and common revenue stream scenarios. This analysis applies to industries in which portfolio cross-licensing is common and is thus expected at some point during the lifespan of a patent.[7] Some industries, in which patents typically remain unlicensed to preserve a monopoly for as long as possible, may not have much

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[3] *See* FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 62–67 (Mar. 2011).

[4] *Id.* at 1.

[5] Leigh Kamping-Carder, *Video Game Industry a Boon to Lawyers*, LAW360 (Aug. 19, 2011), http://www.law360.com/articles/245300. *See also* Dan Rivoli, *Tort Costs Make US Cos. Less Competitive: Panel*, LAW360 (May 24, 2011), http://www.law360.com/articles/246840.

[6] Kelce S. Wilson, *Is Licensing a Patent Selling an Invention?*, INTELL. PROP. TODAY, Feb. 2011, at 11.

[7] *See* John M. Browning & Carla S. Mulhern, *Licensing in the Presence of Technology Standards*, LICENSING J., Aug. 2009, at 1, 7 (providing a brief explanation of cross-licensing).

relevance here.[8] Therefore, it is worthwhile to examine the question of whether a patent is likely to be included in a portfolio cross-license.

II. TO LICENSE OR NOT TO LICENSE

Various industries may be characterized as either a "single patent product" industry[9] or a "thousand patent product" industry.[10] A single patent product is one which only a single patent, or a relatively small number of patent families, covers a typical market-ready version.[11] For example, pharmaceuticals and other relatively simple consumer items are single patent products.[12]

In contrast, a "thousand patent product" is one where hundreds or even thousands of patent families will almost certainly cover a typical marketable version, due to the product's inherent complexity and consumer demand for a plethora of features that are the focus of heavy patenting efforts.[13] Examples of thousand patent products include telecommunication devices and computer systems.[14] In these industries, the products are so complex and the number of unknown patents is so large that it is impractical to even attempt selling a system that can avoid all potential tenuous infringement accusations.[15] An intended non-infringing product will be so obsolete and devoid of features that it will certainly experience consumer scorn and marketplace rejection.[16]

Diverse industry types have differing norms with respect to cross-licensing.[17] In many single patent product industries, cross-licensing can

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[8] *See* Patrick H. Higgins, *Chemical Compounds and Biologics Developing Issues Relevant to Market Exclusivity*, INTELL. PROP. TODAY, July 2011, at 24, 26 (noting this type of an industry scenario).

[9] *See id.* at 26.

[10] *See* Browning & Mulhern, *supra* note 7, at 1.

[11] Higgins, *supra* note 8, at 26.

[12] *See id.*

[13] *See* Browning & Mulhern, *supra* note 7, at 1; *Inventive Warfare*, ECONOMIST, Aug. 20–26, 2011, at 57.

[14] Browning & Mulhern, *supra* note 7, at 1–2.

[15] Wilson, *supra* note 6, at 8, 12; *Inventive Warfare*, *supra* note 13, at 57.

[16] Wilson, *supra* note 6, at 12.

[17] *See Patent Medicine*, ECONOMIST, Aug. 20–26, 2011, at 10; Colleen V. Chien, *Predicting Patent Litigation* 8–10 (Santa Clara Univ. Sch. of Law, Working Paper No. 17–11, 2011), *available at* http://ssrn.com/abstract=1911579.

be optional and may actually be undesirable.[18] In some situations, a long-term monopoly for a particular product is more profitable, even though the monopoly is accompanied by exclusion from a competitor's patent portfolio.[19] This is common in the pharmaceutical industry.[20] Here, the question of whether to license is a strategic choice that includes decision-making factors that are outside the scope of this article.

However, in a thousand patent product industry, cross-licensing or some other type of "patent peace" is effectively mandatory, for consumers to have access to feature-rich products from multiple competing sources.[21] "Royalty stacking" is an accumulation of royalty burdens from multiple independent licensors who each attempt to extract the maximum amount from a single product.[22] It may be a significant problem in the thousand patent product industries.

Burdensome royalty stacking is an ever-present threat by patent trolls that practice nuisance assertions, in which the expected value of the litigation for the plaintiff is not determined by the merits of the infringement allegation, but rather by the defendant's expected litigation cost.[23] A meritless assertion can be dropped, and a patent license granted, in exchange for the defendant paying the plaintiff some amount that is less than the defendant's expected costs for a successful defense—both actual attorney billings and the effect of disruptions to business operations.[24]

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[18] Higgins, *supra* note 8, at 24; Patrick H. Higgins, *Patent (IP) Exclusivity—Small Molecule Compounds and Biologics: Part II*, INTELL. PROP. TODAY, Aug. 2011, at 30, 30. *See also Patent Medicine*, *supra* note 17, at 10.

[19] Higgins, *supra* note 8, at 24; Higgins, *supra* note 18, at 30. *See also Patent Medicine*, *supra* note 17, at 10.

[20] Higgins, *supra* note 8, at 24; Higgins, *supra* note 18, at 30. *See also Patent Medicine*, *supra* note 17, at 10.

[21] *See* Browning & Mulhern, *supra* note 7, at 7.

[22] Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1993 (2007).

[23] Jonathan L. Moore, *Particularizing Patent Pleading: Pleading Patent Infringement in a Post-*Twombly *World*, 18 TEX. INTELL. PROP. L.J. 451, 465–66 (2010) ("[T]he significant costs associated with infringement actions are another key factor that incentivizes early settlement. Notably, a patentee and an alleged infringer do not share these costs equally—the alleged infringer bears a much heavier burden.").

[24] *See* Ranganath Sudarshan, *Nuisance-Value Patent Suits: An Economic Model and Proposal*, 25 SANTA CLARA COMPUTER & HIGH TECH. L.J. 159, 161–62 (2008).

III. INCUBATION PHASE

The Incubation phase is defined by a revenue stream that consists primarily of investment capital funding, with the possible inclusion of early sales. In this phase, a primary purpose of a patent may be to protect a fragile revenue stream by maintaining product differentiation (i.e., deterring copying).[25] If the investors are fortunate, this protection will have sufficient scope and duration to permit a new entrant to achieve firm financial footing based on the marketability of its products.[26] Sufficiently clever ideas may generate notably improved product variants in mature industries or else create an entirely new industry segment.[27] For example, patents for push e-mail and thumb-operable QWERTY keyboards launched the smartphone market.

It is during the Incubation phase that the buzz phrase "patents promote innovation" is most likely to be true. This is because in the Incubation phase, a new market entrant uses patents to collect sufficient monopoly profits so that it can face the uphill battle of overcoming some of the barriers to market entry. One of these barriers is a cost structure that is disadvantageous for competing against established manufacturers that have obtained consumer recognition, efficiencies of scale, the benefits of well-established market relationships, a significant IPR income that can subsidize ongoing research and development (R&D), and a complete pay-off of start-up expenses.[28]

The IPR-protected profit enhancement must therefore compensate for a new entrant's cost structure disadvantage, forming a significant part of the basis for justifying monopoly profits.[29] Absent the need to compensate for a cost structure disadvantage—which is lacking for many NPE business models—the justification for monopoly profits becomes weaker. Recovery of R&D expenses that led to the patent is another justification which is

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[25] *See* Kelce S. Wilson & Claudia Tapia Garcia, *The Three Classes of Patent Usage*, 26 LES NOUVELLES 283, 283 (2011) (noting that the primary uses of patents are product differentiation, income, and cost avoidance).

[26] FED. TRADE COMM'N, *supra* note 3, at 44–45.

[27] Dennis C. Mueller & John E. Tilton, *Research and Development Costs as a Barrier to Entry*, 2 CAN. J. ECON. 570, 574–75 (1969).

[28] *See* Harold Demsetz, *Barriers to Entry*, 72 AM. ECON. REV. 47, 49–50 (1982) (discussing barriers generally).

[29] Stephen M. Maurer & Suzanne Scotchmer, *The Independent Invention Defence in Intellectual Property*, 69 ECONOMICA 535, 537 (2002).

often cited by NPEs for monopoly profits.[30] However, this justification applies equally to both manufacturers and NPEs. So, because manufacturers have at least an equal right to recover R&D expenses as do NPEs, and because they also have a need to survive a time period defined by a cost structure disadvantage, manufacturers possess a greater justification for collecting monopoly profits.

Because the phases are defined by the way revenue influences likely IP usage, and IP is used in this phase to enhance profits from product sales, the Incubation phase is reserved for those entities that make or sell products or services (collectively, "manufacturers") under the cover of a patent's exclusivity—either their own or another's patent that has only a limited set of licensees. Although there may be exceptions, the IP-related activities of a new market entrant in this phase are likely to produce a net outflow of revenue, including patent prosecution expenses.[31]

Unfortunately, the current patent system may not be entirely friendly to new market entrants, and instead may work exactly against its stated purpose.[32] Rather than helping to compensate for barriers to entry, the patent system may actually create a significant barrier.[33] When small, a manufacturer is likely to be tightly constrained by an investment-phase budget and is unable to afford litigation-related expenses.[34] Thus, new entrants are particularly vulnerable to nuisance assertions that leverage litigation risk asymmetry to drain precious operating capital.[35]

Initially though, a new manufacturing market entrant may be small enough to escape the notice of established manufacturers, and thus, for a short time, avoid the burden imposed by the older competitors' more extensive patent portfolios. This fortune, however, is short-lived;

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[30] *Id.*

[31] *See* Robert Fletcher, *IP Insurance—What In-House Counsel Needs to Know*, LAW360 (July 29, 2011), http://www.law360.com/articles/260135 (noting also that IP lawsuits are common for companies with innovative or successful IP).

[32] *Inventive Warfare*, *supra* note 13, at 57–58.

[33] *Id.* at 57.

[34] *Id.* at 57–58.

[35] *See Inventive Warfare*, *supra* note 13, at 57–58; Andrew Goldberg, *Patent-Litigation Weekly: The Photo-Sharing Files*, PRIOR ART (May 29, 2009) http://thepriorart.typepad .com/the_prior_art/2009/05/index.html (describing NPE assertions against sixty companies that included "small, family-run start-ups" in which some paid nuisance settlements because they could not afford to defend against what they believed to be a meritless assertion); Kamping-Carder, *supra* note 5 (noting a statement relating patent lawsuits to a tax).

eventually, a new entrant will have either ceased operations (short-circuiting into Depletion), or else attracted the attention of established manufacturers, who are operating in the Saturation and Depletion phases. Those competitors may attempt to counter any advantageous market appeal, which is due to a new entrant's product innovations, by escalating the new entrant's costs through burdensome licensing fees.[36]

To fight back, new entrants often attempt to cross-license with the older manufacturers, rather than merely pay the older manufacturers' license fees in a one-way license.[37] The new entrant, however, may be reluctant to jeopardize product differentiation by including all of its "crown jewel" patents in a cross-license.[38] Therefore, new entrants may often seek to increase ownership of other IP that can be licensed for offsetting value to mitigate costs (i.e., outgoing license fees).[39] This brings the new entrant to the completion of the Incubation phase, which is marked (in most cases), by two milestones: first, sustenance of operations by product sales profit, rather than investment; and second, the addition of licensing cost mitigation to the IPR focus.[40]

IV. DEFENSE PHASE

The next phase, the Defense phase, is defined by investment capital repayment expense and a revenue stream that consists primarily of product sales income. Although product differentiation remains important in this phase, patents are also used to mitigate licensing payments that could otherwise threaten the manufacturer's viability as a producer of goods or

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[36] *See Inventive Warfare*, *supra* note 13, at 57 (noting the use of barriers to entry by entrenched companies).

[37] *See id.* ("[L]egal tussles usually end in cross-licensing deals, in which small sums of money change hands.").

[38] *See* Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, *in* NAT'L BUREAU OF ECON. RES., 1 *INNOVATION* POL'Y AND THE ECON. 119, 127 (Adam B. Jaffe et al. eds., 2001) ("Cross licenses may involve some but not all relevant patents held by either party; carve-outs are not uncommon."); Browning & Mulhern, *supra* note 7, at 7 (suggesting that cross-licensing is sometimes difficult to employ between parties of unequal power).

[39] *See Inventive Warfare*, *supra* note 13, at 57 (describing how an incentive to build up patent portfolios has created an "arms race").

[40] *See, e.g.*, *Patent Medicine*, *supra* note 17, at 10 (explaining how bolstering IPR to mitigate costs motivated Google's $12.5 billion bid for Motorola Mobility).

services.[41] However, not every patent might be licensed.[42] For example, design patents, and other patents that are critical to product differentiation, may be withheld from licensing. The decision factors will likely include the relative value of licensing the differentiating patents along with the remainder of the portfolio, versus the value of maintaining the unique look and feel of a product line by withholding some patents from the outbound licenses.

Some IPR income may exist by collecting royalties from entities that have manufacturing exposure and a relative IPR deficit, but are likely below sales income. Further, on the whole, IPR acquisition expenses will also likely still exceed IPR income.[43] IPR acquisition expenses include patent prosecution and patent acquisition costs, and rightfully, a portion of R&D expenses.[44] Patent acquisition is an alternative to prosecution of home-grown ideas, but may be necessary to rapidly grow patent portfolio strength in light of the typical patent prosecution timeline. Pending patent applications rarely help new manufacturers in cross-licensing negotiations, and a manufacturer can easily be driven out of business during the pendency period of its own patent applications.

To the extent that the defensive use of patents enables an innovative manufacturer to repay investors by keeping licensing expenses manageable, the primary stated purpose of the patent system is still being fulfilled.[45] Enabling the reliable pay-off of investments, which helped to bring a novel product into the marketplace, does serve to promote innovation.[46] However, to the extent that patents merely keep a

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[41] *See* Daniel P. McCurdy & Chris Reohr, *A New Tool for a New Kind of Patent Adversary*, INTELLECTUAL ASSET MGMT., Oct.–Nov. 2008, at 31, 32 (explaining that established companies, such as IBM and Texas Instruments, rely on the strength of their portfolios to leverage licensing negotiations).

[42] *See* Shapiro, *supra* note 38, at 130 (fearing a licensee may imitate its product, a company may be especially hesitant to license a future patent).

[43] *See* McCurdy & Reohr, *supra* note 41, at 32 (noting that substantial licensing income from extensive portfolios is possible, but only for a few companies with substantial investment already undertaken).

[44] *See id.*

[45] *Id.* at 31–32.

[46] *See* FED. TRADE COMM'N, *supra* note 3, at 1.

manufacturer afloat by reducing cross-licensing expenses after investment has been repaid, the patent system is a neutral factor for innovation.[47]

Repayment of R&D expenses via a patent's exclusion right is both uncertain and several years away at best, while product sales improvements can provide a much more rapid and reliable financial reward.[48] At this stage in a company's lifecycle, innovation is less likely to be incentivized by patents and more by the expectation of increased profits. This, in turn, is driven by consumer preferences that can increase market share and deliver a price premium, while competitors' products lag behind.[49]

No rational manufacturer will voluntarily license a patent portfolio on terms that it believes will result in an avoidable cost structure disadvantage relative to its competitors. A higher cost structure predictably results in lower profits and underfunded development of future products, which is a recipe for business failure. Against NPEs, most manufacturers face a common asymmetric risk: NPEs currently enjoy a beneficial lack of cross-licensing exposure due to their lack of manufacturing activity.[50] This beneficial immunity indicates that the patent system may currently, in some situations, disincentivize the actual manufacture of products to put onto store shelves.[51] Therefore, against NPEs, each manufacturer will seek to achieve the most favorable terms that the manufacturer expects have been, or will be, available to any of its competitors. Additionally, a manufacturer will seek a non-infringing design (i.e., a design-around), if avoiding the need to license a patent provides greater profitability.[52] An "ambush assertion" is a tool used by patent trolls to neutralize a manufacturer's ability to design around a patent, by leveraging the expense of design changes after a product model's configuration has been stabilized for cost-effective manufacture. This way, a patent troll can collect royalties that would have otherwise been unavailable, had the manufacturer

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[47] *See* Shapiro, *supra* note 38, at 131 (noting that some licensing could, in theory, be inefficient for innovation).

[48] *See* FED. TRADE COMM'N, *supra* note 3, at 40–41.

[49] *See id.* at 1 (explaining how competition promotes innovation by forcing companies to manufacture products that will help them secure an advantage in the market).

[50] Wilson, *supra* note 6, at 9.

[51] *Id.*

[52] *See* Paul H. Roeder, *Challenging Inflated Damages Claims by NPEs*, LAW360 (July 11, 2011), http://www.law360.com/articles/256383.

known about a patent in sufficient time to avoid liability with a design-around.[53]

However, in cross-licenses with its competitors who possess more imposing patent portfolios, a manufacturer (having a relatively weak portfolio) will almost certainly find itself facing a disadvantageous cost structure from high outbound licensing fees.[54] The magnitude of the cost disadvantage is largely driven by the degree of relative portfolio weakness.[55] Fortunately, this can be overcome by increasing patent portfolio strength, which is not merely a measure of patent counting, but instead may be largely based on the value of a few significant patents.[56] The quicker this portfolio value build-up occurs, the more rapidly the disadvantage will decrease. Thus, manufacturers who survive the Incubation phase have an incentive to speed through the Defense phase as rapidly as is practical.

One strategy for rapidly increasing patent portfolio strength is to initially focus on "business builder" patents that can help maintain product differentiation or be licensed for significant amounts, and then later increase portfolio size through less-expensive "cross-licensing bulk" patents.[57] This strategy can be helpful for a company that is moving from the Incubation phase through the Defense phase.

At some point, though, a maturing company is likely to begin enjoying a net profit on its IP-related activities.[58] This milestone marks the transition into the Saturation phase.

V. SATURATION PHASE

This phase differs from Defense phase by the profitability of the IP-related activities. It is the peak zone for the competitive advantage that can be provided by a manufacturer's patent portfolio. Beyond this phase, the competitive value of significant IPR ownership begins losing importance.

In the Saturation phase, revenue is a mixture of product sales and licensing income. The company's IP department has now shifted from a

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[53] *See* FED. TRADE COMM'N, *supra* note 3, at 134.

[54] *See Inventive Warfare*, *supra* note 13, at 57.

[55] *See id.*

[56] *See* McCurdy & Reohr, *supra* note 41, at 31–32.

[57] *See* Kelce S. Wilson & Claudia Tapia Garcia, *Patent Application Prioritization and Resource Allocation Strategy*, 26 LES NOUVELLES 87, 87–91 (2011).

[58] *See* McCurdy & Reohr, *supra* note 41, at 31–32 (noting the profitability of firms that have amassed substantial IP investments over time).

cost center to a profit center. To the extent that licensing income is derived from ex ante transactions, rather than ex post assertions against independently-invented products, the patents are still being used to promote innovation. Moreover, the research that produces the licensed patents is also the true source of the technology teaching in the industry. However, at the Saturation phase, some established manufacturers can stifle competition from newer, more innovative market entrants by burdening the new entrants with excessive royalty demands and possibly even driving them out of business.[59]

A company that can remain viable as a manufacturer, keeping its product line reasonably fresh and relevant, can stay in the Defense or Saturation phase for an extended period. However, when a company starts becoming obsolete and losing sales, it transitions into the final phase.

VI. DEPLETION PHASE

A strong indicator that a company has entered, or is about to enter, the Depletion phase is that it has decided to significantly forego IPR acquisition aimed at licensing cost avoidance. Instead, the focus is on licensing income. This occurs when the company acknowledges that sales have declined to the point that its own potential patent infringement liabilities to its competitors have significantly mitigated. Some companies, however, might actually have sufficient fortune to successfully reverse their decline and re-enter the Saturation phase with an improved product line.

The Depletion phase is preceded by a condition that can occur years prior and may start an irreversible trend: the near-elimination of patent prosecution for the purpose of maintaining product differentiation. With this situation, the patent portfolio begins aging due to lack of innovation and new, home-grown patents. This time period may be labeled as pre-Depletion, because it may exist for a period of several years as the company transitions out of the Saturation phase.

The label Depletion comes from the idea that a company is attempting to mine its patent portfolio for value to the point of exhaustion. For example, if a former manufacturer's largest source of income is assertion, and settlement value is derived primarily from a single patent on a fifteen year old invention, it is hard to dispute that the company has become devoid of innovation and is merely exploiting old ideas for whatever scraps of value that the patent system permits.

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[59] *Inventive Warfare*, *supra* note 13, at 57.

VII. PHASE CRITERIA COMPARISON

A convenient comparison reference chart is provided below to determine a particular IP usage phase based on some selected business parameters.

Phase	**Patent Usage**			**Primary Revenue Sources**			**Patent Activities**	
	Product Diff	Cost Avoidance	Income	Investment	Product Sales	Licensing	Net Cost	Net Income
Incubation	X			X			X	
Defense	X	X			X		X	
Saturation	X	X	X		X	X		X
Pre-Depletion		Losing	X		Losing	X		X
Depletion			X			X		X

During the Incubation phase, a new manufacturing market entrant uses patents to differentiate its products, obtains its primary income from investment, and sees patent activities as a cost. As the new manufacturer begins using patents for cross-licensing cost avoidance and reduces its reliance on investment by gaining sales profits, it moves into the Defense phase. Patent activities, including application prosecution and possibly purchasing existing patents, typically remain a net expense.

When patent activities begin to pay for themselves by earning sufficient licensing income, the company moves into the Saturation phase. Product differentiation is likely still needed for the company to remain viable as a profitable producer of goods or services.[60] Cost avoidance is still required because even well-established companies will seek to maintain favorable cross-licensing terms that preclude a competitively disadvantageous cost structure.[61]

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[60] *See, e.g.*, Pete Brush, *Google Walking Tightrope with $12.5B Motorola Buy*, LAW360 (Aug. 15, 2011), http://www.law360.com/ip/articles/264824 (noting Google C.E.O. Larry Paige's description of Google's intention to purchase Motorola Mobility as an attempt to "supercharge" Google's Android platform).

[61] *See, e.g.*, *id.* (noting one attorney's assessment that Google's potential acquisition of Motorola Mobility's patents may "[put] Google on an equal footing with its rivals going forward").

When the company's sales drop significantly enough that the licensing income dominates the total income, the company moves into the pre-Depletion phase and then eventually into the full Depletion phase. In this final phase, and in the transition period, product differentiation is no longer relevant. Because the company has lost its exposure to patent infringement suits by its former competitors, it is essentially an NPE.[62] Cross-licensing gives way to outbound licensing and the cost avoidance usage of the patent portfolio evaporates.[63] Even for NPEs that never experienced a period of profitable product sales due to business failure in the Incubation phase (short-circuit) or else by choice, their place on the chart is easily found: the Depletion phase.

VIII. PATENT TROLLS AND NPES

At this point, a more detailed distinction between patent trolls and NPEs may be helpful, and two example cases that highlight the proposed patent troll definition are provided.[64] It is reasonable to recover expenses and even profit in exchange for providing a true benefit to the public.[65] However, some patent assertions are made after-the-fact, against independently-invented products, when the product inventors, who clearly innovated themselves to produce the accused products or services, had no idea that the patents even existed.[66] Further, some asserted patents may not provide clear, relevant, forward-looking teachings on how to modify prior art systems to avoid the allegedly infringing ones.[67] Instead, some patents support little more than "hindsight scavenger hunts" for sets of features to map against claim limitations that the product inventors genuinely believe

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[62] *See* McCurdy & Reohr, *supra* note 41, at 32 (noting, among other things, that "almost by definition," an entity such as an NPE, which does not sell either products or services, cannot "infringe on the patent rights contained in most patent portfolios").

[63] *See id.* (explaining that the power of a large patent portfolio does not matter when dealing with NPEs as NPEs, by definition, have no need for cost avoidance).

[64] *See* St. Clair Intellectual Prop. Consultants, Inc. v. Canon Inc., 412 F. App'x 270 (Fed. Cir. 2011); Fractus, S.A. v. Samsung Elecs. Co., Ltd., No. 6:09cv203 (E.D. Tex. filed May 5, 2009).

[65] *See* Wilson, *supra* note 6, at 8 (explaining the patent system should provide benefits to those that improve options for the public, but not for those who hold a patent only to gain royalties).

[66] *See* FED. TRADE COMM'N, *supra* note 3, at 8.

[67] *Id.* at 9–10.

to be unrelated to their own innovations.[68] Although a creative plaintiff may be able to optimistically redefine claim terms to stretch to the edge of credibility and cover a wide array of independently-invented products (and only after studying the accused products for an extended period of time), the few engineers who might have read that same patent would merely scratch their heads in bewilderment and receive no practical assistance in designing new products.[69] The engineers would then simply continue designing products as if the patent did not exist, and inject their own creativity and independent innovations into the product design process.[70] For these assertions, the plaintiffs' attorneys may be doing more "inventing" when drafting infringement contentions and Markman pleadings with clever twists on claim meaning than the people who are named as the inventors of the asserted patents.

For these situations, although a patent did exist, there is little public benefit because there is no practical instruction to engineers on how to design new products differently.[71] The patent is less of a teaching and more of a trap to spring upon unwitting target companies, but only after those companies have already invested heavily in the accused design and finalized configuration for manufacture so that it was impractical to make

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[68] *See* Letter from Karl Swierenga, Vice President, FotoTime, Inc., to Hon. Patrick J. Leahy, Chairman, Comm. on the Judiciary (Mar. 9, 2009), *available at* http://thepriorart .typepad.com/files/fototime.testimony-for-the-record.050909.pdf.

[69] *See id.* (noting that the company was in business almost nine years before FotoMedia brought the claim against FotoTime); Emma Start, *Balancing Issued Patents with Pending Applications: The Road to a Healthy Patent Portfolio*, SMART & BIGGAR (Jan. 20, 2011), http://www.smart-biggar.com/en/articles_detail.cfm?news_id=376 (arguing that the entire purpose behind issued patents is to "inform[] the public of the scope of monopoly that has been granted" and to "deter competitors from entering the patent owner's technology space").

[70] In fact, most of the time the engineers are not even aware of the patents they are accused of infringing upon. *See* Brad Burnham, *We Need an Independent Invention Defense to Minimize the Damage of Aggressive Patent Trolls*, UNION SQUARE VENTURES (Jan. 11, 2011), http://www.usv.com/2010/01/we-need-an-independent-invention-defense-to-minimize-the-damage-of-aggressive-patent-trolls.php.

[71] *See, e.g.*, Start, *supra* note 69 (arguing that the entire purpose behind issues patents is to "inform[] the public of the scope of monopoly that has been granted[,]" presumably so that others know how avoid infringing on this "monopoly").

even minor changes to avoid the patent.[72] This is an actual, operating business model for some patent assertion entities.[73] Patent owners that practice "ambush assertions" may specifically avoid alerting targeted manufacturers about patents, with hope that the manufacturers will unknowingly grow their liability prior to notice of the alleged infringement.[74] Because patents used in the Depletion phase often drive up production costs disproportionately to the value of the patents' teachings—especially for ex post assertions in which the alleged innovation in a patent bears no credit for the availability of a product in the marketplace—these patents may actually thwart innovation.[75]

IX. EXPANDING PATENT SCOPE DURING THE DEPLETION PHASE

After a patent has been issued and the owner is attempting to extract the maximum possible cash flow, a common practice, according to manufacturers that endure troll assertions, is that a patent owner may use an overly-ambitious claim interpretation to attempt to expand the scope of the patent to cover unrelated products.[76] For example, the U.S. Federal Trade Commission (FTC) recently noted manufacturers' complaints "that ambiguous claim scope and patent assertions that unreasonably stretched the reach of claims to cover seemingly unrelated products make it impossible to identify all patents that they might eventually face in litigation."[77]

Patent practitioners who subjectively intend to violate the clarity requirement of the U.S. Code to withhold from the public a proper notice of what a patent covers (and therefore what it does not cover) make this

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[72] *See, e.g.*, Swierenga, *supra* note 68 (arguing that it was financially better for FotoTime to settle the claim against it than fight it); Start, *supra* note 69 (arguing that some companies with pending patent applications wait until "the competitor commercially exploits the technology" to gain an element of surprise, because by this time the competitor has invested heavily and it is too late for change).

[73] *See* Start, *supra* note 69 (noting a "surprise" method, identified as "ambush assertion" here).

[74] *See id.*

[75] *See* FED. TRADE COMM'N, *supra* note 3, at 53, 58, 68.

[76] *Id.* at 13 ("One concern raised repeatedly during the hearings was that claims frequently use terms with no apparent definition in the specification. Litigants disputing claim interpretation may turn to different dictionaries to find a favorable definition.").

[77] *Id.* at 55.

"ambush assertion" tactic easier.[78] According to the FTC, "Some applicants may have incentives to draft ambiguous claims that might be viewed narrowly by the [Patent and Trademark Office (PTO)] and then construed broadly in litigation."[79]

Although the FTC's statement may appear harshly accusatory of some patent prosecutors, evidence supporting it can be found in prosecution practice materials, including the following:

> If a prosecutor is drafting a patent on behalf of a nonpracticing entity, which is mainly interested in collecting and licensing a portfolio of patents, there can be benefits to writing claims that are intentionally vague.
>
> In general, large established companies that are making widgets or drugs are more interested in making sure their true inventions are not used by others and benefit more from clear claim language . . . But those involved in large-scale patent portfolio collection and licensing may obtain more value with less clarity in claims because it may make others a little uncertain about whether they need the patent or not.[80]

A recent case, *St. Clair Intellectual Property, Inc. v. Canon Inc.*,[81] provides an example of this claim stretching act in practice in which, years after patent grant, the PTO publicly stated that the patent owner's ambitious redefinition of claim scope was unreasonably over-reaching.[82] The Federal Circuit noted that "[d]uring reexamination, five different examiners, including three different Supervisory Patent Examiners, rejected the [trial] court's interpretation of the claim language."[83] To reach appeal, the defendant had to spend a large sum on its defense, while other

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[78] *See* Start, *supra* note 69 (clarity requirement found in 35 U.S.C. § 112).

[79] FED. TRADE COMM'N, *supra* note 3, at 10.

[80] Erin Coe, *5 Ways to Draft Bulletproof Patent Claims*, LAW360 (Jan. 25, 2011), http://www.law360.com/articles/206437 [citation to patent attorney omitted].

[81] 412 F. App'x 270 (Fed. Cir. 2011).

[82] *See id.* at 276–77. In reversing the lower court, which had broadly interpreted the claim language, the appellate court gave "significant weight" to the examiners' narrower construction of the claim language. *Id.*

[83] *Id.* (emphasis added).

risk-averse manufacturers had taken licenses.[84] However, were those licenses evidence of patent value, as was likely trumpeted at trial, or instead an undeserved windfall for a plaintiff who exploited ambiguities in claim scope?

Because patents are ostensibly contracts between an applicant and the government, perhaps lawmakers should bring patent law into conformance with the Restatement (Second) of Contracts. Some sections, notably §§ 20, 201, and 206, penalize contract drafters for ambiguous language and, if applied to patent drafters, could motivate patent prosecutors and litigators to be cautious about exploiting potential differences in claim interpretation.[85] Note that, at least in Texas, "[a] contract is ambiguous when its meaning is . . . reasonably susceptible to more than one interpretation."[86] In the contracts world, ambiguity is construed against the drafter.[87] Why isn't this time-proven concept applied to patent claim interpretation?

An example of an assertion that lacks notice because the patent claims are reasonably susceptible to more than one interpretation and lack sufficient clarity to ascertain scope until after a lawsuit had already begun can be found in the home state of *Heritage*, in the Eastern District of Texas case *Fractus, S.A. v. Samsung Electronics Co., Ltd*.[88] When granting a reexamination of one of the asserted patents, the PTO stated:

> One point though, is the record is not entirely clear what exactly these limitations mean. Neither the Notice of Allowance nor the Preliminary Amendment have any discussion of the meaning of these terms, and they are not clearly defined—or apparently discussed at all—in the specification. In fact, words that would seem important or relevant in describing these claim elements, such as "projection," "exposed," "extension," "least number," "linear," and "curved," are not found anywhere in the '208 patent other than the claims. The examiner, like the requester, therefore finds it reasonable to *look to the*

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[84] *See* St. Clair Intellectual Prop. Consultants, Inc. v. Fuji Photo Film Co., 674 F. Supp. 2d 555, 557 (D. Del. 2009), *rev'd sub nom.* St. Clair Intellectual Prop. Consultants, Inc. v. Canon Inc., 412 F. App'x 270 (Fed. Cir. 2011).

[85] RESTATEMENT (SECOND) OF CONTRACTS §§ 20, 201, 206 (1981).

[86] Heritage Res. Inc. v. NationsBank, 939 S.W.2d 118, 121 (Tex. 1996).

[87] RESTATEMENT (SECOND) OF CONTRACTS § 206.

[88] No. 6:09cv00203, 2010 U.S. Dist. LEXIS 134502 (E.D. Tex. Dec. 17, 2010).

> *related litigation concerning the patent to see what the patent owner apparently believes falls within the broadest reasonable interpretation of the claims*.[89]

Even the PTO needed to study the patent owner's assertions—first provided seven years after the patent's priority date—to determine what supposedly was and was not covered by the claims.[90] How could the public be expected to know whether it infringed? So much for the clarity requirement, cited in the U.S. PTO's Manual of Patent Examining Procedure (MPEP):

> 2173 Claims Must Particularly Point Out and Distinctly Claim the Invention: The primary purpose of this requirement of definiteness of claim language is to ensure that the scope of the claims is clear so the public is informed of the boundaries of what constitutes infringement of the patent.[91]

Intentionally vague claims enable a patent owner to collect additional licensing income that would otherwise be unavailable with clearly defined claim scope, because the public is not reliably informed of what does and does not constitute infringement.[92] Manufacturers, who are apprehensive about liability risk—even for practicing only the prior art—will often pay off a patent owner to avoid litigation.[93] Patent prosecutors, who advocate drafting intentionally vague claims, are practicing what they perceive certain courts have chosen to facilitate.[94] Otherwise, patent prosecutors would fear invalidation of their work and would draft patent claims clearly, even for NPE clients, thus aligning more closely with the policy behind the notice requirement.[95]

Both of these described cases illustrate a situation in which a patent owner sought to redefine claim coverage—years after the patents issued —

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[89] *Inter Partes* Reexamination, application no. 95/001,389, at 4, USPTO (emphasis added) (internal citation omitted), *available at* http://portal.uspto.gov/external/portal/pair (enter the portal and search the listed application number).

[90] *See id.* at 3–4.

[91] MPEP § 2173 (8th ed. Rev. 8, July 2010).

[92] *See* Coe, *supra* note 80.

[93] FED. TRADE COMM'N, *supra* note 3, at 50, 54.

[94] *Id.* at 85.

[95] *See id.* at 85, 101.

to extract profits from independently-invented products.[96] The products were available in the marketplace with no credit due to any alleged innovation that was taught in the patents themselves.[97] Was there any innovation involved in developing the accused products? Naturally there was, and it was clearly the innovation of the product inventors themselves.[98] The innovations of product inventors actually benefit consumers in a practical way because those innovations are available on store shelves.[99]

However, to the extent that the patent system might have been used to obtain license fees from the accused manufacturers, the real innovations—those which appeared in the products due to the ingenuity of the product inventors and thus tangibly benefitted the public—would have been rendered more expensive to produce and therefore less accessible to the public.[100] Innovations that were proven to be beneficial by marketplace successes of actual products were taxed in favor of speculative, alleged innovations in previously unknown patents.[101] The speculative benefit of paper-only innovations is even more tenuous when patent terms are opportunistically redefined with the benefit of hindsight to extend beyond the PTO's understanding of the granted claim scope.[102] In some situations, there are two innovations at issue: one by a patent inventor and a separate one by a product inventor.[103] Usage of patents, similar to the cited cases, actually thwarts—rather than promotes—innovation that tangibly benefits the public.[104]

X. MECHANISMS BY WHICH PATENTS PROMOTE INNOVATION

As already explained, the three uses of patents—product differentiation, cross-licensing cost avoidance, and generating licensing income—might also variously promote innovation, thwart innovation, or

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[96] *See id.* at 101, 120–21.

[97] *See id.* at 138–39 (providing an economic analysis of the marketplace and how patents, and necessarily their substance, enter and take a share of the marketplace).

[98] *See id.*

[99] *Id.*; Wilson, *supra* note 6, at 8.

[100] *See* Wilson, *supra* note 6, at 8.

[101] *Id.* at 9.

[102] *See id.* at 8–9.

[103] *Id.*

[104] *Id.*

be neutral regarding innovation.[105] To credibly claim that a particular usage of a patent promotes innovation, it is necessary to both provide a credible explanation for a mechanism that links IPR to investment and to demonstrate that the IPR does not burden innovation that has a higher value to the public.[106] For example, practical innovation by an independent inventor who designs products that the public actually uses is generally more beneficial to society than alleged innovation in a patent that is intentionally written to be vague and is therefore effectively of no use to people who design new products.[107]

The mechanisms for promoting innovation that have been described thus far include: first that the patent is the true source of the lesson to the industry, which enables manufacturers to produce products that they could not have produced without the patent (or possibly, academic writings by the inventor that are covered by the patent); and second that the patent enables a manufacturer to remain profitable and thus to stay in business while selling innovative products.[108] This latter mechanism has two sub-parts, including product differentiation, which prevents copying so that the manufacturer can demand a price premium that incentivizes innovation and repays investment; and mitigation of cross-licensing expense, so that an innovative manufacturer is not driven out of business by burdensome licensing fees imposed by its competitors.[109]

All of these mechanisms have a commonality—a "but-for" causal relationship between a patent and the availability of an innovative product to the public.[110] Without this but-for causality, patent usage is, at best, neutral regarding innovation, but can actually become an economically inefficient burden, or effectively a tax that is unrelated to the independent,

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[105] Wilson & Garcia, *supra* note 25, at 289.

[106] *See* FED. TRADE COMM'N, *supra* note 3, at 40–41.

[107] *See* Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. (forthcoming 2012) (manuscript at 38–39), *available at* http://ssrn.com/abstract=1762793.

[108] *Id.* at 8; FED. TRADE COMM'N, *supra* note 3, at 40.

[109] Reihan Salam, *Ban Software Patents*, NAT'L REV., July 4, 2011, at 26–27; *Inventive Warfare*, *supra* note 13, at 57–58; *Patent Medicine*, *supra* note 17, at 10.

[110] *See* Salam, *supra* note 109, at 26–27; *Patently Different*, ECONOMIST, Aug. 20–26, 2011, at 58.

practical innovations that are made available to the public by product inventors.[111]

XI. CALCULATING CAPS ON EXPECTED LICENSING FEES

A patent owner seeking to license a patent may wish to predict an expected income.[112] To do so accurately, the patent owner should understand important considerations that manufacturers face when making business decisions.[113] To the extent that a certain course of action would be a poor business choice, a manufacturer will not willingly take that action.[114] Understanding these realities enables more realistic predictions and could result in a more successful licensing program.[115]

Licensing can occur in two primary settings: ex ante licensing, in which the patent owner offers a manufacturer an opportunity to use the patent prior to infringement; and ex post licensing, in which the patent owner demands royalties for alleged infringement.[116] In ex ante licensing, the manufacturer has a choice whether to alter existing products to incorporate the patented features, and can thus perform a rational cost-benefit analysis prior to making any product alterations.[117] In ex post licensing, one of the calculation methods for litigation damages award is an

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[111] *See* Salam, *supra* note 109, at 26–27; *Inventive Warfare*, *supra* note 13, at 57–58; *Patently Different*, *supra* note 110, at 58.

[112] *See generally* Mario A. Lopez & Stephen P. Rusek, *An Economically Sound Framework for Negotiating Licenses*, LAW360 (Aug. 12, 2011), http://www.law360.com/articles/261805 (explaining how a patent owner needs to assess the fair market value of the patent before negotiating a license).

[113] *See id.* (explaining that patent holders must consider that manufacturers may have alternatives to patents that would lower the patent value or, in contrast, consider that truly innovative patents could have higher litigation costs associated with the licensing cost).

[114] *See id.* (explaining that the most a business will pay for a license is defined by the incremental economic profits the business plans to gain and that if the cost of the patent license is over the profit threshold, the business should not pursue the patent license).

[115] *Id.*

[116] *See* Richard Gilbert, *Deal or No Deal? Licensing Negotiations by Standard Setting Organizations,*1–2, 9, COMPETITION POL'Y CENTER, INST. OF BUS. AND ECON. RES., UC BERKELEY (June 2011), http://elsa.berkeley.edu/users/gilbert/wp/Gilbert_ Deal%20or%20No%20Deal_15%20June%202011.pdf.

[117] *See* FED. TRADE COMM'N, *supra* note 3, at 54, 139 (discussing how a potential licensee can negotiate by weighing the cost of adopting alternatives or incorporating the technology into other products).

attempt to simulate a hypothetical licensing negotiation that resulted in a voluntary agreement.[118]

Going into an ex ante licensing negotiation, a manufacturer will perceive at least three different caps on the maximum licensing fee that it will pay. Exceeding any of these caps would be a poor business choice that could eventually result in business failure. If the patent owner will not provide an offer that is within the lowest of these three caps, there will likely be no license agreement. In a litigation's hypothetical negotiation, because the assumption is made that an agreement was reached, that amount should also be within the lowest of these three caps.

These caps may be somewhat independent and should be estimated separately. They include a fee amount that does not put the manufacturer into a disadvantageous cost structure relative to its competitors; a fee amount that, when aggregated with other existing and future expected demands (i.e., stacked royalties), does not render the product so expensive that sales are likely to suffer; and selling the product with the patented features, while paying the fee, results in a higher total profit than selling an alternative product version that does not require paying the fee. In thousand patent product industries, royalty stacking concerns may dominate due to the large number of independent licensors. To motivate a manufacturer to accept a license offer, the patent owner may need to convince the manufacturer that the offered fee is within all three caps.

XII. CONCLUSION

There are three different classes of patent usage, and four different phases. The three classes of usage are product differentiation, licensing income, and cross-licensing cost avoidance. The four phases are Incubation, Defense, Saturation, and Depletion. A typical business will use predictable combinations of these classes in each of four different phases that roughly correspond with sequential stages of a business lifecycle.

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[118] *See id.* at 143 (discussing that "putting a patentee in the position it would have been" before the infringement "requires replicating the bargain the parties themselves would have struck prior to the infringement").