

# The Patent Ecosystem in IT: Business Practice and Arbitrage

*“The Evolving IP Marketplace”*

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Brian Kahin

Senior Fellow

Computer & Communications Industry Association

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PRESENTATION]

“Patents are not Nobel or Pulitzer prizes! They are not for exceptional inventors but for average inventors and should not be made hard to get.... Why must an invention be a commercially hot number to be patentable? If it is a total dud, how is the public injured by a patent on it? A monopoly on something nobody wants is pretty much of a nullity. That is one of the beauties of the patent system. The reward is measured automatically by the popularity of the contribution.”

Giles S. Rich, *The Principles of Patentability*, 28 *Geo. Wash. L. Rev.* 393, 407 (1960), reprinted in John Witherspoon, ed., *Non-Obviousness: The Ultimate Condition of Patentability*, at 2:1, 8 (BNA 1980).

This simple Newtonian, very democratic, but ultimately naïve view of the patent system explains why we are where we are today. Judge Rich was the co-author of the 1952 Act and the dean of Federal Circuit jurisprudence that pushed the patent system to its limits along many dimensions. Under his view, there is no harm in giving out patents freely, because patents are only assets that may or not be of value. There is no downside to making patents easier to enforce, easier to get, more plentiful, more powerful, and harder to invalidate. The system

takes care of itself because it is no more than an aggregation of self-limiting patents.

Judge Rich had in mind the market for the discrete “productized patent” – the “better mousetrap.” This rough correspondence between patent and product is not that far from reality in certain sectors, including pharmaceuticals, the sector where patents are most important to the basic business model. However, it does not fit the complex IT product, with its thousands of patentable functions and components, layers of overlapping functionality, and, in the case of software, widely distributed independent innovation with low barriers to participation.

One great achievement of the 2003 FTC report, *To Promote Innovation*, was to show – for the first time in an official document – how (and to some extent, why) the system worked differently in different sectors as a matter of practical economics. This aspect of the report has been validated by the unprecedented inter-industry divisions over patent reform, as well as by the empirical evidence assembled by James Bessen and Michael Meurer in their book *Patent Failure*. These developments reveal the growing gulf between process and results -- between the one-size-fits-all laws and procedures around which the system revolves and the economic outcomes that it is intended to promote.

The 2003 FTC report stands out as a landmark effort to bridge the gap between law and economics – rather than assuming the traditional article of faith that law inevitably inevitably leads to the right economic result. Recommendation 10 reads: *Expand Consideration of Economic Learning and Competition Policy Concerns in Patent Law Decisionmaking*. AIPLA’s apoplectic reaction to Recommendation 10 made it all too apparent how great the gulf is.<sup>1</sup>

The disconnect between the legal perspective on individual patents and the economic consequences of the patent system is in large measure due to lack of information on how patents (or rather portfolios of patents) are used and experienced in the real world of business. We know little about what happens to patents after they go out the door. Only a very small number end up in litigation – although this in part because litigation is prohibitive costly and uncertain. Information about business practices is anecdotal, subjective, and fragmented, leaving this critical level of analysis missing because we lack coherent data.

What’s missing is the “meso” level in this framework for analyzing patent policy:

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<sup>1</sup> [http://www.aipla.org/Content/ContentGroups/Issues\\_and\\_Advocacy/Comments2/Patent\\_and\\_Trademark\\_Office/2004/ResponseToFTC.pdf](http://www.aipla.org/Content/ContentGroups/Issues_and_Advocacy/Comments2/Patent_and_Trademark_Office/2004/ResponseToFTC.pdf)

## levels of analysis

1 -- micro	individual patent	law
<b>2 -- meso</b>	<b>portfolios, (cross-) licensing, pools, markets, trolls</b>	<b>business practice</b>
3 -- macro	System-level effects, aggregate private benefits vs private costs	economics
4 -- meta	relationship to other innovation models, means of appropriating returns	innovation economics

Note that the diagram includes a “meta” level as part of the overall patent ecology: how the patent system interacts with other innovation models and incentives. As the well-known 1994-95 Carnegie-Mellon survey shows,<sup>2</sup> there are other means for appropriating returns from innovation, and patents are not the most important in most industries. In addition, standards development plays an important complementary role in promoting innovation in IT. More recently, open source development has become an important innovation model for software. These practices need to be considered alongside patents, especially since we know that interact with patents in problematic ways.

Keeping these levels in mind is important because it is not possible to opt out of the patent system, even if a company believes that patents are counterproductive in its field of technology. The problem of keeping the different levels straight is illustrated by an early New York Times report on Bessen and Meurer’s research.<sup>3</sup> The article’s title, “A Patent is Worth Having, Right? Well, Maybe Not,” confuses the researchers’ system-level “macro” analysis with desirability from a business perspective (“meso”). While the researchers question the net benefits and costs of the patent system for certain sectors, patents, even bad patents, always have some value and are therefore worth having.

Note that there are in fact sublevels within a very rich and complex meso level:

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<sup>2</sup> See footnote 5. below.

<sup>3</sup>

<http://www.nytimes.com/2007/07/15/business/yourmoney/15proto.html?scp=1&sq=bessen%20meurer&st=cse>

## *levels within business practice*

- (legal) tactics
- context-dependent strategy
- position-dependent strategy
- business models
- market vision
- policy vision

The fundamental disconnect between legal process and economic results has worsened in the past five years. The notion that patents serve as adjunct protection for technological assets has been left in the dust, as patents, divorced from the technology they represent, are used in increasingly diverse and creative ways as legal instruments. While technology is embedded knowledge, a patent is in fact only a negative right to exclude others, basically an option to litigate, and not an affirmative right to practice the technology. While the value of the patent is often confused with the value of the underlying technology,<sup>4</sup> the two are separate and have become increasingly divorced in practice.

A cottage industry has grown up over the past ten years to help patent owners “extract value” from patents as assets distinct from the business value of the underlying technology. While options to litigate may be assets, they also represent liabilities for others. Once liberated from the nominal ideal of protecting technology against imitators, patents become versatile instruments that can be used in a great variety of ways. The Carnegie-Mellon survey shows some of these business uses, although it still shows protection against copying to be the most common use:<sup>5</sup>

- measure performance 8%
- licensing revenue 29.5%

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<sup>4</sup> Remarkably, the European PatVal surveys do precisely that, valuing patents by asking inventors for the value of their patented invention so as to necessarily include the value of the underlying technology as well as the premium added by patent protection.

<sup>5</sup> W.M. Cohen, A. Goto, A. Nagata, R.R. Nelson & J.P. Walsh, “R&D Spillovers, Patents and the Incentive to Innovate in Japan and the United States,” *Research Policy*, Vol. 31, Nos. 8-9, December, 2002, pp. 1349-1367.

- for use in negotiations 55%
- prevent suits 72%
- **prevent copying 99%**
- patent blocking 80% [two different senses]<sup>6</sup>
- enhance reputation 37%

The survey was directed to R&D managers at manufacturing firms and speaks primarily to the use of patents toward competitors, so it may reflect a less strategic perspective than it had it been directed to lawyers.

Despite the fact that the Carnegie-Mellon study was in many respects a follow-on to similar surveys conducted by Harvey Mansfield in the 1970s and Richard Levin in the 1980s, no similar survey has been undertaken in the 14 years since. This failure is especially unfortunate given the increased scope and presence of the patent system, including the shift to intangible subject matter – and the proliferation of uses outside the paradigmatic protection against imitation. Many of the latter were missing or inadequately in the Carnegie-Mellon survey. These include:

- inhibit market entry with portfolios
- hold up complex products
- ambush standards
- exploit imbalance in litigation resources
- portfolio evergreening
- instill uncertainty in competitors' customers
- collusive settlements (suppress prior art, transfer patents)
- use of portfolios to defeat exclusive rights
- use of RAND licensing to extract cross-licenses
- temporary assignments (both offensive and defensive)
- assignments out of portfolios for surrogate attacks
- situational assertions (IPOs, product launches)
- track and capture standards

Most of these practices are offensive rather than defensive and many are directed not to competitors but to mere implementers and users, who may have little or no reason to be aware of patents that may be asserted against them. Importantly, these practices generally do not emanate from manufacturers R&D labs. While some involve uses of manufacturers' portfolios, many reflect the growing presence and strategic behavior of non-practicing entities specializing in patent assertions. All these uses have incentive effects – i.e., they add to the perceived value of patents. But they also have effects on competition that are

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<sup>6</sup> This was apparently realized after the survey. Blocking can mean fencing

not part of the traditional policy rationale for patents, such as making harder for small entities to compete in product markets.

Most of this is unreported private behavior, so it is very difficult to get a fix on how common these overlapping practices are. However, there are two divergent motivations.

One is the more established practice of cross-licensing portfolios to achieve “freedom of action.”

The other is the “value extraction” that is increasingly in evidence as specialists becoming adept at using patents to extract value in the form of revenue from others.

The two motivations can overlap for portfolio owning producers, but they reflect the tension between product orientation and patent orientation, and they work to pull patent value in two opposite directions.

Portfolio cross licensing allows major producers to, in effect, opt out of the patent system with respect to each other and to compete at the product level. Market-based expectations about competition and pricing of commodity components were set decades ago when there was little patenting of abstract functionality in software and semiconductors – in part because patents could be designed around easily, in part because of the early culture of the industry, and in part because of the cost and uncertainty of patent protection for abstract functionality. Products were priced low and were constantly competed to lower levels as both technology and the scope of the market advanced. In this context individual patents were generally not worth much but their value could be aggregated in large portfolios that could be cross-licensed to other major producers. Freedom of action was critical for producing firms because of the hugely disruptive power of patents, and fortunately this freedom could be had largely for barter (cross-licensing) rather than hard cash.<sup>7</sup>

So as the number of patents per product grew, there was little effect on costs to manufacturers, in effect, further diluting the value of individual patents. As long as patenting remained commensurate with the scope of product sales, firms could treat each other as peers and swap nonexclusive rights to their portfolios.<sup>8</sup>

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<sup>7</sup> Cross-licensing presents a major unresolved problems in valuing intangibles. Is value imputed to licenses flowing both directions – or only to net (balancing) payments? The large (BEA) figures cited for international transactions included imputed value in both direction. However, IRS regulations only require reporting of any cash payments received. Carol A. Robbins, “Measuring Payments for the Supply and Use of Intellectual Property,” pp 15-17, available at [http://www.nber.org/books\\_in\\_progress/crws06/robbins5-21-08.pdf](http://www.nber.org/books_in_progress/crws06/robbins5-21-08.pdf)

<sup>8</sup> In principle, as Dan McCurdy has put it, net users pay net innovators. More precisely, the current value of the cross-license is the scope of the accessed portfolio times the size of the user company’s product market. So a large producer could swap rights of access to its large portfolio with small producer with a small portfolio, without the need for balancing payments. However, the

At the same time, the scale of portfolio practice operated as a barrier to entry to product markets for new firms. In other words, individual patents might still enable start-ups to enter certain niches in technology markets, but the presence of large portfolios would naturally inhibit growth into product markets. Instead, it encouraged startups to sell out to large firms that had the cross-licenses needed to create and market products.

By contrast, the value of individual patents outside of portfolios grew as new uses emerged. Furthermore, the opacity of the patent environment in IT grew. This was partly because of the increasing functional complexity of products, but also because of Federal Circuit jurisprudence that made patent easy to get, harder to invalidate, more powerful, and available for increasingly abstract subject matter. These developments reached an apogee with the *State Street* decision authored by Judge Rich and in the “help customers get patents” mission adopted by the PTO in the late 1990s.

By opacity, we mean generalized information failure. Which leads to information asymmetry, and therefore to arbitrage. The burgeoning of new uses and business models means an expanded strategic space – in which there is growing distance between patent markets and product markets, and between the intangible economy and the tangible economy.

In the first instance, arbitrage is simply the product of a wide variety of problems in evaluating and valuing patents, including:

- indeterminacy of claims construction (especially for abstract subject matter)
- secrecy about contemplated and filed applications before publication
- amending scope after publication, especially in continuations
- tension between enabling information and disabling information
- high cost of validity and infringement opinions
- practical impossibility of clearance searching
- disincentives to invalidating low-quality patents
- limited enabling disclosure in software and business method patents
- liability for willful infringement inhibits reading patents
- “thickets” and thicket strategies
- lack of information on assignments and licenses
- settlements leave dubious patents standing and legal issues unresolved
- ambiguity surrounding obviousness

The 2002 hearings were especially useful in bringing the opacity problem out on the table. Bessen and Meurer emphasize “notice failure” as the principal reason that patents fail as property under their cost-benefit framework. Mark Lemley has also written a number of articles on information failure in the patent system:

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larger company will have superior bargaining power (in part because it can better manage the costs of patent practice) and can argue that the larger portfolio offers the smaller company the potential for a larger range of products.

Probabilistic Patents (with Carl Shapiro),<sup>9</sup> Ignoring Patents,<sup>10</sup> and Copying in Patent Law (showing very little evidence of copying; with Christopher Cotropia).<sup>11</sup>

In pharmaceuticals, where patents are relatively few and held by well-known entities, information about patents is meaningful. In IT, especially in software, there is too much information, much of it deficient and costly to evaluate, especially relative to the market value of tangible products. As Mark Lemley puts it:

[B]oth researchers and companies in component industries simply ignore patents. Virtually everyone does it. They do it at all stages of endeavor. From the perspective of an outsider to the patent system, this is a remarkable fact. And yet it may be what prevents the patent system from crushing innovation in component industries like IT.<sup>12</sup>

While litigation is costly and risky, the discounted costs are less than the aggregate costs of searching. The equilibrium in IT is to avoid rigorous product clearances, accepting infringement as a necessary cost of doing business, and working to make the inevitable settlement and litigation less costly. The different equilibria in practice leads to different approaches to policy – and explains why the system appears “broken”. It really has become two systems: one centered in pharmaceuticals and biotech where there is genuine tech transfer with licensing – and the other centered in IT and services where much of the licensing is either in bulk or after the fact.

One of those most revealing quotes from the 2002 hearings was from Frederick Telecky of Texas Instruments. In arguing against disclosing TI’s patents in the context of standards setting, he said:

“TI has something like 8000 patents in the United States that are active patents, and for us to know what’s in that portfolio, we think, is just a mind-boggling, budget-busting exercise to try to figure that out with any degree of accuracy at all.”

This may be self-serving in the standards context, but consider how much more difficult it is to know what’s in the hundreds of thousands of patents that belong to somebody else. Especially for a small company that lacks knowledge management capacities of a Texas Instruments. It explains why portfolio cross-licenses are negotiated in large part on the basis of numbers rather than trying to evaluate and calculate the total value of thousands of individual patents. Cross-licensing enables the parties not only to opt of the exclusivity that the patent system provides but to opt out of much of the cost of evaluating patents.

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<sup>9</sup> Journal of Economic Perspectives, Vol 19 No 2, Spring 2005, 75-98, <http://faculty.haas.berkeley.edu/shapiro/patents.pdf>

<sup>10</sup> Michigan State Law Review, Vol. 2008, No. 19, 2008. Available at SSRN: <http://ssrn.com/abstract=999961>

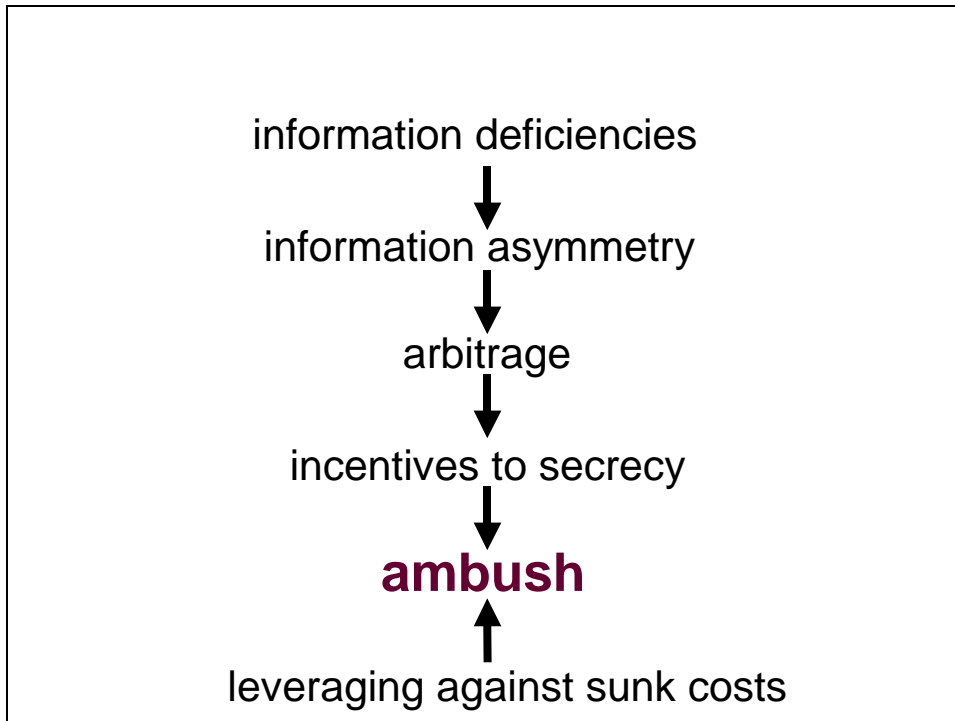
<sup>11</sup> Stanford Public Law Working Paper No. 1270160. Available at SSRN: <http://ssrn.com/abstract=1270160>

<sup>12</sup> Abstract for Ignoring Patents, footnote 10. above



## Context-driven Arbitrage

Information failure means information asymmetry which leads to arbitrage. But patent arbitrage is also driven by context-dependent differences in value. Patents are simply more valuable when they can be asserted without fear of counterclaims. And under Coase's theorem, private trade will lead to a reallocation of rights to those who value them most – as reflected in the “highest and best use” standard in real estate appraisal. To be sure, there are transaction costs in getting there, but that's where the arbitrage comes in.



Migration of value from the tangible economy of products to the intangible economy of litigation options is pulled along both by opportunities for arbitrage and the efficiencies of specialization. A business model of “being infringed” will pay close attention to what patents mean and who is infringing them.<sup>13</sup> And it will lie in wait until the victim is deeply invested and unable to escape.

There are other models for context-related arbitrage. IBM recently assigned patents to Barracuda Networks, an open-source company facing a patent infringement lawsuit Trend Micro. These patents enabled Barracuda to counterclaim against Trend Micro, often an effective defense in convincing producing companies to settle.<sup>14</sup>

<sup>13</sup> See Markus G. Reitzig, Joachim Henkel, and Christopher Heath, On Sharks, Trolls, and Other Patent Animals - 'Being Infringed' as a Normatively Induced Innovation Exploitation Strategy. Available at SSRN: <http://ssrn.com/abstract=885914>

<sup>14</sup> <http://arstechnica.com/news.ars/post/20080702-barracuda-bites-back-at-trend-micro-in-clamav-patent-lawsuit.html>

But the big money lies in moving patents from producer portfolios to specialists in “being infringed.” The more infringed, the valuable the patent. Hence the tremendous incentive to assert patents inadvertently embedded in industry standards – and to wait to sue until the standards are embedded in the entire industry’s mass-marketed products. Hence also, the growing temptation to release patents from portfolios to those who can make “better” use of them by evading the original owner’s constraints and commitments, attacking the original owner’s rivals, instilling fear in the marketplace, and extracting the maximum possible return without fear of counterclaims or adverse publicity.

It is the greatest of ironies that a patent system intended to promote public disclosure has become so shrouded in secrecy and uncertainty that it threatens to undermine markets for tangible products. In part, this happens because patent applicants and patent owners are allowed to exploit secrecy without paying for the burden it imposes on innovators, competitors, and the market. Thanks to patent jurisprudence that indulges patent applicants, the patent incentive includes the privilege of hiding patent information from productive businesses making huge investments in all phases of innovation – design, integration, production, distribution, and marketing.

An instrument designed to protect against imitators has turned into a license for a wide range of undocumented and unregulated private behavior. A vehicle for promoting innovation has created an open season for distributed private regulation, operating in a dense fog of deficient information.

Unlike credit default swaps, these are not privately created rights. These are rights created by public grant. They should come with obligation of accountability and public disclosure not only in the individual patent specification, but in how business practices do or do not work to promote innovation and economic well-being.