

THE PATENT HOLDER'S DILEMMA: BUY, SELL, OR TROLL?

The current patent process in many ways works against IT innovation by making the road to realization too dispiriting for today's independent inventors.

Imagine being a recent graduate in computer science, having invented a new and improved method for displaying browser plug-ins. With help from some generous friends and the last bit of your life savings, you are successful in patenting your invention. You're on top of the world. *Now what?* You consider starting up a corporation to commercialize your innovation—except that you are hoping for an academic career, not an entrepreneurial one, and do not have the \$2 million in capital funds necessary to start the business. Since the innovation necessitates being embedded in other components to go to market, you consider licensing or selling your patent to Big Tech Co.—except you don't think you have much leverage and will probably get sold short. Exhausted by the proactive approach, you consider selling it to an attorney who promises to find and litigate any infringement suits on a contingency basis. What's an innovator to do to reap the rewards of the patent?

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Illustration by PIERRE MORNET

Now imagine that you are the CEO of Big Tech Co. Your company has recently developed revolutionary technology for data compression. The firm patents the invention. *Now what?* If there is an immediate market demand for the technology, you will certainly develop it into a product, which may be comprised of many other patents as well. If there doesn't seem to be a place for it, you may file it away in the firm's patent bank. If it can be used as a bargaining chip to get the right to another patent, you may consider licensing or cross-licensing to another firm. Of course, you can also consider using it defensively in order to block a competitor's new product launch. What should you do?

Every patent holder deems (or hopes) their patents to be an asset—one whose value depends on its transferability and its participation in webs of technology. In the end, patent holders, who have expended resources in hopes of generating profit from their patents, must decide which business model to pursue in order to optimize their return. Although many opt for proactive business models, some use patents as tools to hold a competitor or even an industry hostage. A brief overview of the patent system followed by an analysis of common and emergent patent business models can act as a guide—and a warning—for any inventor seeking to profit from a patent.

THE U.S. PATENT SYSTEM AND SOFTWARE PATENTS

Before exploring the business of patents, it is necessary to understand the legal infrastructure that supports the U.S. patent system and how the system itself has evolved in regards to software. A patent is a government-granted monopoly given to an inventor as both a reward for their intellectual and financial investment and a stimulus to innovate. This monopoly includes the legal rights to exclude others from exploiting the invention in any way for a period of 20 years from the date the patent application was filed. The premise, of course, is that without such reward, there would be less incentive in society to innovate and thus progress would be paralyzed.

The U.S. Patent and Trademark Office (PTO) is charged with methodically examining each patent application to select those that merit legal protection based on five basic criteria of patentability as set out by the Patent Act. First, the invention must not have

been preceded in identical form in the public prior art (the novelty requirement); second, it must have some practical usefulness (the utility requirement); third, it must be a significant technical advance over what was known (the “nonobviousness” requirement), and fourth, the invention must have been disclosed such as to enable others to make and use the technology. In the realm of software patents, the disclosure of source code is not required as part of this enablement requirement.

The final requirement is that the invention must be within the list of patentable subject matter. In computing, the scope of patentable subject matter has seen a great judicial expansion over the last 20 years with the broadening of the availability of patents on software and business methods, or processes of doing business. Prior to the 1980s, software programs were considered non-patentable subject matter, as algorithms were traditionally not protected by patent law. In the 1980s, however, U.S. courts began recognizing software inventions as patentable and a veritable explosion in software patent applications and patents issued ensued.

In 1998, a momentous case named *State St. Bank & Trust Co. v. Signature Financial Group, Inc.* solidified the legal ground of patents for software and business methods. In that case, the Court of Appeals for the Federal Circuit (designated in 1992 as the specialized forum for patent disputes) upheld both the software and business methods patents that a financial services company had on a system that managed mutual funds through software. Again, the applications for computer-related patents—this time for business methods—jumped from about 1,000 in 1997 to over 2,500 in 1999 [10] and continues growing today.

Interestingly, although patents issued were on the rise, their values were not. Experts have noted that over 95% of patents are unlicensed and 97% generate no royalties [5]. One reason for this, some have argued, may be that software and business methods are inherently incompatible with patent law, given their cumulative and collaborative inventive process, their high level of interconnectivity with other patentable subject matter, and the fact that the economic rewards generated by these inventions are sufficient to promote innovation without the necessity of

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patent protection. Others have noted the expanded breadth of software patents has allowed the PTO to grant overbroad patents by relaxing the criteria of patentability unacceptably. It is also possible that the domination of the industry by giant corporations has hampered the bargaining power of small inventors to license and promote their patents.

ANATOMY OF THE TECH BUSINESS: TECHNOLOGY WEBS

Along with the rise of the patentability of software came a transformation in the role and interrelationships of technology-based patents. Systems and devices have increasingly moved away from being standalone products or “silos” created by a vertically integrated organization to devices based upon technology convergence and integration.

In order to participate in a market centered upon technology convergence, the industry has embraced what management consultant John Hagel terms “technology webs,” [4] or networks in which corporations and patent holders become interconnected through their technologies, products, and intellectual property (IP). Hagel’s proposition is that the higher the density of the “web,” the lower the overall risks for the participating vendors, as the value of the web is then, in part, redistributed to the owners of the intellectual property.

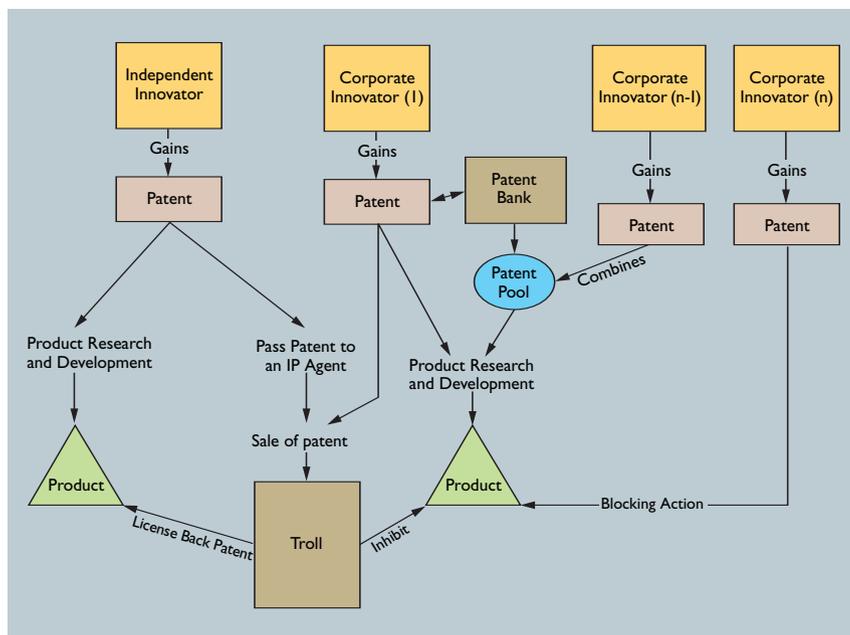
Ownership of a patent is therefore a key to an organization’s ability to influence and participate in a technology web. As such, patent profitability is often tied to a corporation’s status as a “shaper,” or insider in the technology web. Technology web shapers include large corporations with hefty patent portfolios, the ability to set prices of licenses, and the technological capabilities of going around a patented invention in order to avoid a license. Access to the technology web, and thus the market, is limited to outsiders or “adapters,” such as the prototypical garage inventor and those inventors with patents on small components of larger wholes. Hagel reflects that the entities outside the technology web aim to anticipate the shapers’ future moves and capture market share by quickly capitalizing on changes to the technology environment.

The technology webs throughout the computing

industry, along with the newly broadened scope of patentability, have set the contours and limitations for the business models used today. In order to recognize the effect on patents in business, a brief examination of the proactive and defensive patent business strategies employed is in order.

THE (PROACTIVE) BUSINESS OF PATENTS

Patent rights come at a price. In addition to the initial investment, the cost of obtaining and maintaining a patent is estimated to be between \$50,000 and \$100,000 and the patent process takes anywhere from two-to-five years [2]. The nature of patent webs has required the owners of patents to develop a



Paths to profit? The business model of patents.

set of mechanisms through which the assets can be leveraged. The following is a sampling of business models that seek to profit by selling, bartering, or licensing patents or facilitate such transfer (for details see the figure here).

The Garage Inventor. A sole inventor, unaffiliated with a corporation or university, has limited options when it comes to capitalizing on a single patent. The independent inventor can, of course, take the entrepreneurial route and go on to develop a product and bring it to market. When this is not practicable or fails, the independent inventor can opt to pass on their patent to an agent who then can license the patent or sell it to an independent patent collector (a potential “troll”) who may seek to profit by suing potential infringers or even license the patent back to the inventor.

If an entity has but a single patent, the broader question can be raised as to why they do not or can-

not enact to leverage their patent in commerce. Perhaps, as with software, the patent may be of little value as a standalone patent or perhaps the answer lies in their inability to break into the larger technology webs implicitly protected by its members' IP assets. Data compiled by the National Science Foundation and the PTO suggests that corporations are increasingly dominating the issuance of patents by the PTO. In fact, while corporate patents accounted for approximately 73%–78% during the period 1987–1997, in 2004 this figure had increased to 84%. The number of independent individual inventors awarded new patents has fallen from 24% of all patents prior to 1990 to 12% in 2003, [6] a statistic possibly influenced by the emergence of the software patent and the corporate rush to obtain them.

Corporate Patent Bank or Investment Bank? In response to the advent of software patents, Bill Gates issued a memo stating, in part:

“The solution ... is patent exchanges ... and patenting as much as we can... A future start-up with no patents of its own will be forced to pay whatever price the giants choose to impose. The price might be high: Established companies have an interest in excluding future competitors.”¹

The deep financial resources of major corporations allow them to capture and collect many patents. The leading corporate entity in terms of patent ownership since 1993 has been IBM, which has amassed 31,995 U.S. patents [11]. Microsoft, in comparison, has 5,568 patents.² A McKinsey study indicates that any company that owns more than 450 patents and spends in excess of \$50 million on research and development should be able to generate between 5%–10% of its operating income from its IP assets, including profits and licensing revenues [3]. Such is the business model that these corporate patent portfolios generally espouse.

It stands to reason that a corporate patent holder has significantly more options to realize the benefits of its patent. These patents can be used in a variety of ways: as a latent resource for future internal product development, for patent exchanges, or for defensive commercial or litigation purposes. A patent-holder corporation can sell the patent to an independent patent collector who can license the patent to companies or act to inhibit product development. A corporation can also simply have the patent sit in its extensive patent bank or make it available via a patent pool to other corporations with whom it is collaborating toward a product.

Interestingly, corporations such as Microsoft and

How Research Dollars Translate

A survey of institutions by the Association of University Technology Managers (AUTM)³ shows that in 2004 research expenditures were \$41.245 billion (192 institutions) resulting in:

- 16,871 invention disclosures (195 institutions)
- 10,517 U.S. patent applications (183 institutions)
- 3,680 U.S. patents issued (195 institutions)
- 4,783 licenses/options were executed (198 institutions)
 - 45.1% were exclusive licenses
- 27,322 licenses/options were active (191 institutions)
- 68% of new licenses/options were executed with start-up companies
 - 90.9% exclusive licenses
- 11,414 licenses yielded income (196 institutions)
- 6,116 licenses yielded running royalties on product sales (193 institutions)
- \$1.306 billion in income from licenses (194 institutions)
- \$1.122 billion in running royalties on product sales (187 institutions)
- 462 new companies were created based upon academic discovery

¹AUTM U.S. Licensing Survey: FY 2004: A Survey of Technology Licensing (and Related) Performance for U.S. Academic and Nonprofit Institutions, and Technology Investment Firms. A.J. Stevens, F. Toneguzzo, and D. Bostrom, Eds. Northbrook, IL, 2005

IBM are beginning to invest resources to leverage their patent assets beyond their immediate technology webs by offering IP inducements to entrepreneurs aimed at creating new technology webs. IBM, for example, has “pledged open access to key innovations covered by five hundred of their software patents to individuals and groups working on open source software,”³ however this represents only 0.01% of their patent asset bank.

The Invention Company. In parallel with the ascent of corporate IP as an asset class has been the development of the IP-based organization as a standalone entity, or patent-holding company. This model both creates IP and acquires patents for the purpose of licensing and creating new businesses entities that use the patented inventions as a basis for product development.

One such “invention company” is Intellectual Ventures, a Bellevue, WA firm, founded in 2000 by two ex-Microsoft engineers and a former Intel attorney. The firm holds an estimated 4,000 patents,⁴ from

¹F. Warshofsky. *The Patent Wars*. Wiley, NY, 170–171.
²USPTO database search (9/28/06) for assignee Microsoft.

³www-03.ibm.com/press/us/en/pressrelease/7473.wss.

⁴www.intven.com/docs/02505060001IntVen.pdf.

The weight of evidence indicates that the patent system as a whole may inadvertently act against the independent innovator with a single patent and hinder creativity and innovation—the opposite result the patent system intended.

which it seeks to generate licensing and sale revenues. The company has also pledged to facilitate the development of products through the provision of open source resources.

Some commentators have warned that such invention companies can exploit their assets by bundling patents together and may ultimately act as entities that exist solely to pursue infringement cases.

IP Intermediaries. For entities whose IP asset base and revenues are below the critical mass levels indicated in the McKinsey study noted earlier, the overhead associated with independently researching, marketing, and licensing products can be a prohibiting factor in gaining a return on their IP investment.

One class of institution in this category is universities. Research data developed by the Association of University Technology Managers (AUTM) shows that while some academic institutions are commercializing their innovative power, they may not be achieving their full profit potential due to a lack of resources devoted to their offices of technology transfer. A survey of 192 institutions by AUTM showed the average number of full-time equivalent employees was 4.3—illustrating the institutional limitations that universities suffer in fully developing their patents (see “How Research Dollars Translate”).

BRIDGING THE “TECHNOLOGY WEB” GAP?

The following business models incorporate the idea of patent transferability into several different forums. They aim to reduce transaction costs between patent holders and licensees or buyers and facilitate a freer flow of information, regardless of the entity’s status within the “technology web.”

Internet-based IP Marketplaces. The Internet and the emergence of patents as a valued asset have created a demand for forums in which buyers and sellers of patents can communicate. In order to facilitate transfer of patents the following Internet-based marketplaces have been developed since 1995.

The Patent and License Exchange was founded in 1998 in an attempt to create an end-to-end online marketplace for the transfer of patents. The company developed a straightforward procedure for buying and selling patents employing a search engine for locating a technology within its patent bank, a real options-

based asset valuation model to facilitate a rapid convergence in pricing between the parties, patent insurance to guard against potential legal claims, and escrow to facilitate the flow of royalties between the parties.⁵ Citing a low volume of tradeable technology assets, the exchange was closed down and the company was acquired by Access Integrated Technologies, which has focused the company on providing IP management software.

Another Internet patent marketplace, yet2.com, was founded in 1999 to facilitate technology acquisition, licensing, and IP portfolio analysis.⁶ The company offers free access to much of its database, where patent filings have been rewritten in accessible language and format, rather than the legalized PTO format. Recognizing that customers frequently are interested in bundles of patents in a single area, it has grouped its products by category thus simplifying search. The marketplace has attracted over 100,000 members including universities such as Scotland’s University of Stirling, which used it to license a U.K.-patent pending cross-modal predictive electronic filter they designed to be able to adapt to temporal correlation patterns between different inputs and the final output regardless of the length of reaction delay.⁷

The Internet-based patent marketplaces, although a novel idea for linking potential buyers and sellers of patents, have been hindered in their development by several factors. First, there is frequently a high degree of information asymmetry between the holder of the patent and its potential purchaser or licensee on the potential valuation of the patent. As Arora et al. point out, the “one patent one innovation” concept no longer applies in a majority of instances, as innovation requires “patent bundles” to function, and one patent may be a member of multiple bundles [1]. Second, while the aim of the markets is to allow transactions to take place in an environment of low transaction costs, patents are not commodities and as such the ability to create low cost or zero transaction costs trades is limited. Third, many firms just wish to barter

⁵For details, see Harvard Business School case study: The Patent and License Exchange: Enabling a Global IP Marketplace, Case 5-601-124.

⁶www.yet2.com/app/about/about/press?page=press49.

⁷Institute for Neuronal Computational Intelligence and Technology, Technology Note: Cross-Modal Predictive Electronic Filter, Kevin Swingler.

EOLAS V. MICROSOFT

In 1998, the University of California was granted a patent for a method for displaying browser plug-ins, and titled “[d]istributed hypermedia method for automatically invoking external application providing interaction and display of embedded objects within a hypermedia document.”¹ The University of California granted an exclusive license to the patent to the inventor, cellular biologist and then-adjunct professor Michael Doyle. Doyle had founded Eolas Technologies, Inc. in 1994 and was its sole employee.

In 1999, Eolas brought an infringement lawsuit against Microsoft Corp., alleging that certain aspects of Microsoft’s Internet Explorer incorporated its invention. In 2003, a jury found that Microsoft infringed upon Eolas’ patent and awarded damages of \$520 million.² The court also issued an injunction against Microsoft, prohibiting it from further distributing the Internet Explorer product if a licensing agreement with Eolas could not be reached.

On appeal, Microsoft alleged that Eolas’ patent was invalid because the technology had been invented and developed as early as 1993 by another inventor. The injunction was stayed and the case was remanded to the lower court for further proceedings on the issues of anticipation, obviousness, and inequitable conduct by Doyle.³

As to the monetary damages awarded, Microsoft argued that its liability was limited to royalties on each golden master disk shipped abroad, not to each copy of Windows loaded onto machines by the foreign original equipment manufacturers. The Federal Circuit, in considering whether software code exported on a “golden master” disk could be “a component of a patented invention” under section 35 U.S.C. §271(f), rejected this argument, holding that intangible software code qualified as a component of a patented invention within the meaning of the statute.

As of this writing, there has been no ruling on the remanded issues. However, the effects of this battle are being felt in both legal and technology circles. And many fear that such effects could change the basic workings of the Web. In October 2005, in a move that surprised many, the PTO reaffirmed the contended patent.⁴ Later that month, the Supreme Court denied Microsoft’s petition for reconsideration on the question of limiting its liability to domestic sales, leaving Microsoft to fight the battle in the lower courts. In the meantime, Microsoft announced in March 2006 that it would change the way that Internet Explorer handles Web pages containing embedded content in its Internet Explorer security update package. **C**

or trade licensing options rather than sell their patents, which would favor the use of an IP information portal rather than a marketplace. Finally, markets that do not use an auction model may find it difficult to achieve an optimal bid price for customers’ patents due to a lack of potential bidders in the markets and the associated competition in pricing.

Patent Auctions. The traditional format of live auction bidding provides the patent owner with an alternative option to Internet-based markets. Ocean Tomo, a Chicago-based “intellectual capital” merchant bank, holds live patent auctions. At an April 2006 event, for example, it auctioned 78 patent lots, 31 of which were ultimately sold for \$8,446,100.

However, many of the same problems apply to physical auctions as to Internet-based ones, for example: time-compressed due diligence, a low number of bidders, and disparate quality and value levels between the patents on offer.

IP Information Portals. The Internet has spawned a number of IP information portals aimed at providing technologists, inventors, and companies with information on prior art. Although the PTO offers a free searchable database listing issued and pending patents, this database is confined to U.S. patents. Thus, several organizations have created and offer “added value” services. One such company, Delphion, uses the Derwent World Patents Index to structure its database of in excess of 13 million inventions from over 40 different international patent-issuing authorities.

Founded in 1996, one of the first Internet-based IP information portals was PatentCafe (www.patentcafe.com). This portal developed a “Latent Semantic Analysis” search engine, allowing customers to examine an international patent knowledge base. Services such as patent alerts, analytics, and valuations are also provided using for accessing and building IP assessment profiles.

In 2004, Thomson-Financial, the major publisher of financial services information, acquired Information Holdings, Inc., a patent information database, for \$426 million, illustrating the value of IP information services. Thomson’s PatentWeb, (also known as MicroPatent) allows for searches of databases covering U.S. and international patent authorities.

THE (DEFENSIVE) BUSINESS OF PATENTS

Against the backdrop of the proactive, profit-generating patent business models, a series of alternative mechanisms have arisen that highlight patent assertion and litigation in order to generate revenue without necessarily producing.

Patent Trolls. The term “patent troll” is said to

¹U.S. Patent No. 5,838, 906 (the ‘906 patent).

²*Eolas Technologies Inc. v. Microsoft Corp.*, U.S. Dist. Ct. N.D. IL, No. 99-C-626.

³See *Eolas Technologies Inc. v. Microsoft Corp.*, 399 F.3d 1325 (Fed. Cir. 2005).

⁴The 73-page PTO notice is available at universityofcalifornia.edu/news/2005/ptonotice0905.pdf.

have arisen in the late 1990s in reference to a group of patentees who asserted infringement over Intel's Pentium II semiconductors and subsequently threatened to shut down the industry with an injunction. In testimony before the House Judiciary's Subcommittee on Courts, the Internet, and Intellectual Property, patent trolls were recently defined as an entity that "has no significant assets except patents; produces no products; has attorneys as its most important employees; and acquires patents, but does not invent technology itself" [7].

The prototypical *modus operandi* of patent trolls is as follows. A non-inventor entity with no products of its own purchases or is assigned a patent. The new owner/patentee then "trolls," or searches, for corporations that may be infringing on the purchased patent. The new owner/patentee then sends hundreds or thousands of letters offering to license the technology or, alternatively, demanding large settlements and threatening legal action. As both patentee and infringers know, such legal action may result in a court-ordered injunction or in large monetary damages that may far exceed the original value of the patent. Either remedy threatens to shut down entire product lines or even industries. And this may be true even if the patented technology is one small component of a larger mass of thousands of patents that comprise one product, as is often the case with software.

The popular media has been quick to adopt this moniker to loosely term all patent plaintiffs. *MercExchange v. eBay*, *Eolas v. Microsoft*, and the now infamous *NTP v. RIM* (Blackberry case) are only a few of such examples. All three embarked in massive lawsuits against some of most powerful corporations in technology and succeeded in amassing large judgments or settlements. For example, in *Eolas v. Microsoft* (see accompanying sidebar), a jury awarded patent holder Eolas \$520 million after finding that certain aspects of Microsoft's Internet Explorer infringed upon an inventor's patent for a method for displaying browser plugins. This enormous figure represented a \$1.47 royalty for every copy of Windows sold in both the U.S. and abroad since Windows 95 was released, plus an additional \$45 million in prejudgment interest. Surprisingly, Eolas' David vs. Goliath story did not win much popular support. Observers have labeled the plaintiff's litigious behavior abusive of the existing patent system and indicative of an urgent need for its reform. Of course, it must be noted that in many instances, patent assertion is a wronged patent holder's only redress against a legitimate infringement of its patent.

Patent assertion has developed into a niche industry for some patent lawyers, who sometimes defend the patent holders on a contingency basis (meaning the

patent holder pays no fees unless a favorable ruling or settlement is achieved, in which case the lawyer would take about one third). Although it may be an alternative route for the lone inventor who has been shut out of the market, it is by no means free of its own transaction costs. As anyone who has experienced a lawsuit may know, litigation costs can be driven up significantly as part of a litigant's strategy, ending up as a financial "game of chicken" with the winner having the deeper pockets. Microsoft, for example, assesses it "spends close to \$100 million annually to defend against an average of 35–40 patent lawsuits simultaneously."⁸ A patent infringement lawsuit "will easily cost \$1.5 million in legal fees alone to defend." For patent suits with claims exceeding \$25 million, those expenses may reach \$4 million per side [9]. Of course, in the *Blackberry* case, the plaintiff's lawyers received one-third of the patent infringement settlement, which in this case amounted to over \$200 million.

Blocking Patents. Another notorious defensive business strategy is known as the "hold-up" problem, where a product launch is stalled due to the discovery that one of the many patents comprising it is violating a patent [10]. In the IT industry, where hundreds or thousands of patents can embody a product, this problem poses a real threat. The owner of the critical piece of technology may feel that a potential licensee's participation in a web would be detrimental to its own overall corporate strategy and refuse access to their patents, thus forcing the product out of the market or raising its cost to consumers and irreparably harming its manufacturers.

As such, patents can be used as disruptive and anti-competitive weapons and are sometimes termed "blocking patents." Economists and legal scholars have speculated that such a problem is a consequence of the recent expansion in software patents and most agree that blocking patents deter innovation, unreasonably give larger corporations competitive advantages over the individual innovator, and ultimately inhibit the development of the software industry.

A WAY FORWARD

This article has examined the current U.S. patent system and the growing importance of patents as profit centers through proactive and defensive business models. In doing so, we have described the IT industry in terms of "technology webs" that define who has the bulk of the patents, the bargaining power, and the competitive advantage. While inno-

⁸www.microsoft.com/presspass/features/2005/mar05/03-10patentreform.msp.

vation based upon a single patent does occur, as witnessed by the phenomenon of Google, the weight of evidence indicates that the patent system as a whole may inadvertently act against the independent innovator with a single patent and hinder creativity and innovation—exactly the opposite result that the patent system intended.

The results of this inherent inequity have been evidenced recently by the emergence of patent trolls. A number of recent high-profile court cases such as *NTP v. RIM* (Blackberry) and *eBay v. MercExchange* have caused observers to point to abusive litigation as a symptom of overexpanded software patentability and an overtaxed PTO and to advocate legislative reform.

Calls to reform the patent system's weakest links have focused on, among other things, improving patent quality, remedying disclosure rules, fortifying the PTO through funding, creating lower-level patent courts, and eliminating some of the uncertainty surrounding patent remedies [8]. A stronger and more focused Patent Act would diminish uncertainty in the system that leads to instability and abuse. As part of such revision, the wisdom of protecting software should be revisited in light of the nature of the technology and the industry. ■

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Coming Next Month in COMMUNICATIONS

February

ANTI-SPAM TECHNOLOGIES

Recent research indicates spam overload has caused 25% of users to reduce their use of email. Indeed, no discussion about email today can ignore the topic of spam. This cover story explores many of the new techniques and recent work on email and spam. And you will find many of these spam-stopping techniques can be applied to other problems.

Also in February:

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