

# Issues in TECHNOLOGY Innovation

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## Patents: A Singular Law for the Diversity of Innovation

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### EXECUTIVE SUMMARY

Not long ago, patents were viewed as a subject consigned to specialists with law and a technical background. Now branded as *intellectual property*, they have moved front and center in an economy dependent on innovation for sustainable growth. Yet as patents have expanded in number, power, and subject matter, they have drawn controversy as well as attention.



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Today a unitary, deeply institutionalized legal system confronts an increasingly diverse technological and business environment. High demand, low standards of quality, and the extreme complexity of information have led not only to immense portfolios but to new varieties of strategic behavior. Large investments in product development are put at risk by the leveraging power of individual patents, and networked services and industry standards make especially attract targets because of the embeddedness and breadth of investment. While China has been criticized relentlessly for not respecting intellectual property rights, China now appears to be emulating the high-volume, low-quality U.S. model, but on its own terms.

Innovation is always a risky undertaking. In principle, patents help reduce risk by allowing an inventor a limited period to exclude others from exploiting the invention. However, the patent system can also create risk and uncertainty. Juries are notoriously unpredictable in patent cases, and judges have had difficulty applying the law, including the language of patent claims, with consistency. A

#### Issues in Technology Innovation

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lawyer's opinion on whether a patent is valid may cost \$15,000 or more – and another \$15,000 or more for an opinion on whether a particular technology infringes the patent – but with no guarantees. But the greatest uncertainty facing innovators comes from the sheer volume of patents, most of which belong to somebody else.

The creation of the Court of Appeals for the Federal Circuit in 1982 was designed to make the patent system more consistent and predictable, at least at the appellate level, where there appeared to be inconsistency among the regional circuits. The Federal Circuit quickly became a champion of its specialty, making patents more powerful, easier to get, harder to attack, and available for a nearly unlimited range of subject matter. Low standards combined with the increased power of patent holders compounded the problem of indeterminacy. Patents grew in number and could be asserted aggressively after others had made huge investments in developing products that happened to infringe.

Controversies over the effects of this “strengthening” of the patent system simmered out of public sight until the Federal Trade Commission (FTC) and the Department of Justice held 24 days of hearings in 2002. In 2003, the FTC issued a landmark report that showed widespread concerns about patent quality and the functioning of the system, especially in information technology. The FTC report and a subsequent report by the National Academies spurred proposals for legislative reform.

Debate on patent reform often divides along the value chain (upstream vs. downstream) and across industries characteristics (complex vs. discrete technologies). Upstream research and design firms want leverage over downstream manufacturers, distributors, and retailers. Companies that assemble and market complex products are especially vulnerable to patents on the many thousands of individual components and functions that make up complex products.

The contrast between discrete and complex technologies is at the root of the so-called “patent paradox.” There are far fewer patents in pharmaceuticals than in information technology, but a single patent can enable huge investments to be made in clinical testing and regulatory approval – and can effectively secure the market value of a billion-dollar drug. Information technology is much more patent-intensive, but because there can be thousands of patentable functions in a very inexpensive product, the value of the technology protected by each individual patent is diluted. Yet individual patents can be valuable if inadvertently infringed, and IT firms have built up massive portfolios of patents for defensive purposes – to counter infringement claims. But “trolls” – or more politely, “patent assertion entities” – do not create products for the market. Undeterred by defensive portfolios or concerns about reputation, they can assert patents with impunity.<sup>1</sup>

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<sup>1</sup> See data collected by Patent Freedom: <https://www.patentfreedom.com/research.html>.

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## The Law of Large Numbers (of Patents)

Although divergent interests have frustrated congressional efforts at reform, the Supreme Court has taken a renewed interest in patents. On several issues too contentious to be considered for reform legislation, the Court has stepped in and reversed the Federal Circuit: In *eBay v. MercExchange*, it abolished the rule of automatic injunctive relief for patent infringement; in *KSR International v. Teleflex*, it effectively raised the required inventiveness by striking down a Federal Circuit rule that made patents easy to get (A “teaching, suggestion, or motivation” to combine elements had been required to invalidate patents on combinations of known elements.); in *MedImmune v. Genentech*, the Court made it easier for licensees to sue; in *Quanta v. LG*, it breathed new life into the exhaustion doctrine, so that once a patented component or product was sold, patent rights went with it. The Court is currently reviewing the strong presumption of validity that the Federal Circuit gives to patents despite the very limited scope of the examination process at the Patent Trade Office (*Microsoft v. i4i*).

While the tightening of the system will undoubtedly have ameliorating effects, portfolio-scale patenting already operates in ways that stray far from the popular image of patents protecting lone inventors from corporate behemoths and opportunistic foreigners. Instead, patent portfolios are used to secure “freedom to operate” with respect to competing producers. Large volumes of relatively low-value patents can protect market position – not just particular technologies. When technology evolves in an incremental or cumulative manner, portfolios can be evergreened with new patents, effectively prolonging dominance over an area beyond the 20-year term of individual patents.

On the other hand, the very large numbers of patents in play ultimately threatens large producers of complex technology. When companies fail or simply exit an area of technology, their patents no longer serve the original purpose and can be sold to those that can extract the most value from them: patent assertion specialists. For the specialist, the most lucrative target is a successful product – or better, a complex service with millions of subscribers (think Blackberry) where an inadvertently infringed patent gives the patent holder leverage over an entire ecosystem.

How can patents, which are disclosed to the public, be inadvertently infringed? The answer can be seen in how unwilling companies may be to disclose their own patents in the course of developing industry standards. As Frederick Telecky of Texas Instruments (TI) explained to the U.S. Federal Trade Commission:

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,

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budget-busting exercise to try to figure that out with any degree of accuracy at all.<sup>2</sup>

If well-resourced companies cannot readily identify relevant patents in their own portfolio, then clearly the public disclosure function of the patent system has failed. Paradoxically, the Internet conditions us to think that information is nearly costless and that by putting patents online the public disclosure function of the patent system has been eminently fulfilled. But as noted above, knowledge about patents is surprisingly costly and uncertain. Not only are there far too many information technology patents, there is no information at all on applications that are not yet filed or published (usually 18 months after filing). A newly published FTC report, confirms the scope of the problem, explaining how case law solicitous of patent owners has undermined certainty for innovating companies.<sup>3</sup>

This does not seem to be a problem in pharmaceuticals and chemicals. In areas where claims are tied to molecular structure rather than the ambiguities of the English language, patents are comparatively few and well-defined. However, the problem appears especially severe for software and business method patents, two controversial areas where the subject matter and the language of the claims are relatively abstract.

The disclosure problem is magnified by fundamental problems of quality – the quality of the examination process and the quality of the claimed invention. This is expressed in terms of novelty: Is the invention really new or is there prior art? And non-obviousness: Is it inventive enough to deserve a patent? The lower the standard of inventiveness, the more prior art there will be to sift and sort through. This is a huge problem for complex technologies – especially software, where functionality can be created by anybody with a computer.

Abraham Lincoln famously said: “The patent system added the fuel of interest to the fire of genius, in the discovery and production of new and useful things.” However, the statute is much less discriminating. A patent may be refused only when the subject matter is “obvious to the person having ordinary skill in the art” – with the burden on the patent examiner to show obviousness.

One hundred years later, Judge Giles Rich, who as a patent attorney had primary responsibility for drafting the 1952 Patent Act, wrote:

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

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2 Frederick J. Telecky, “Statement at FTC/DOJ Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy,” FTC/DOJ hearings (February 28, 2002). Available at <http://www.ftc.gov/opp/intellect/020228telecky.pdf>.

<sup>3</sup> *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition*, available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>.

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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.<sup>4</sup>

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Judge Rich, the dean of Federal Circuit jurisprudence, assumes perfect information about routine invention, equates patents with products, and envisions a self-regulating market in which each patent is valued as a product. In the complex, interdependent world of information technology products and systems, this view is untenable. The assumptions behind it and the persistence of a one-size-fits-all patent regime have resulted in a high volume of low-quality patents of uncertain value that are difficult and costly to interpret and evaluate, individually and collectively. The result is an opaque system riddled with information asymmetries and opportunities for arbitrage.

### **Evolving Patent Practice**

The public often assumes that a patent is a right to exploit a new idea – that it is an asset on which other ideas and investments can build. But a patent is only a right to exclude others from using the technology; it does not guarantee that the technology is free from the underlying claims of others. Nor is a patent self-enforcing. It is an option to litigate, and patent litigation is “the sport of kings.” In the past, IT companies have not undertaken litigation lightly, especially against competitors who also held arsenals of patents that could be used in retaliation.

But the flood of IT patents has created new opportunities. Failing companies, whether startups or diminished giants like Kodak, have turned to their patents to salvage value for shareholders at the expense of successful firms. In a disturbing development, patent wars have broken in the smart phone market, as Microsoft and Apple have taken to suing their rivals – a spectacle that did not happen with personal computers.

Meanwhile, a host of “patent aggregators” have sprung up. The largest, Intellectual Ventures, has an estimated 35,000 patents and binds its large investor/licensees to secrecy. Some aggregators are styled as defensive pools to prevent patents from falling into the hands of trolls. Their patents can also be sold (perhaps with an option to repurchase) for asserting counterclaims against patent plaintiffs. Since patents can be used for different purposes in different contexts, aggregators seek the best of both worlds. A practice known as “catch and release” involves acquiring patents, granting nonexclusive licenses to producing companies, and then selling the patents to trolls who can aggressively pursue those who have not taken licenses. Patent pools that once helped clear rights for enabling industry-standard technologies have turned to soliciting patents in order to attack competing

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<sup>4</sup> 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).



standards.<sup>5</sup>

## The Vulnerability of Standards

Standards are an especially attractive target for patent trolls because they are embedded not just in the offerings of one company but across an industry. A company cannot unilaterally withdraw from using the standard. Once a standard is embedded on products in the market, it is nearly impossible for an industry to mobilize to change it.

Standards are critical for innovation in information and communications technologies, but as important as they are, standards get trumped by the deeply institutionalized legal power of patents. The deference to patents is all the more remarkable given the very limited patent examination process and the presumption that the applicant is entitled to a patent unless the examiner can show otherwise. For example, the examiner may deny the application on the basis that it is obvious to a “person having ordinary skill in the art.” This statutory language might make sense in an artisan economy, but in a globalized economy where competition operates at elevated and sophisticated level, keying invention to “ordinary skill” makes for large numbers of relatively trivial patents. By contrast, standards are developed in an open and collaborative process among experts, so the final standard must stand up to a high degree of peer review.

Guidelines for developing standards commonly emphasize the importance of an open process. Not so for patents: There are opportunities and incentives for taking advantage of the relative secrecy of the patent application. Under U.S. law, an applicant may re-file without limit, making it virtually impossible for the Patent and Trademark Office to conclusively deny an application. Ironically, the more open a standards process is, the more susceptible it is to capture by patent applicants tracking the process and modifying patent applications accordingly. The Federal Circuit has even explicitly endorsed this practice:

[T]here is nothing improper, illegal or inequitable in filing a patent application for the purpose of obtaining a right to exclude a known competitor's product from the market; nor is it in any manner improper to amend or insert claims intended to cover a competitor's product the applicant's attorney has learned about during the prosecution of a patent application.<sup>6</sup>

This indulgence of legal maneuvering does not play well outside of the U.S. legal community. Unlimited re-filings (“continuations”) are a uniquely American practice, and patent quality as a whole is considered to be lower in the U.S. than elsewhere.<sup>7</sup>

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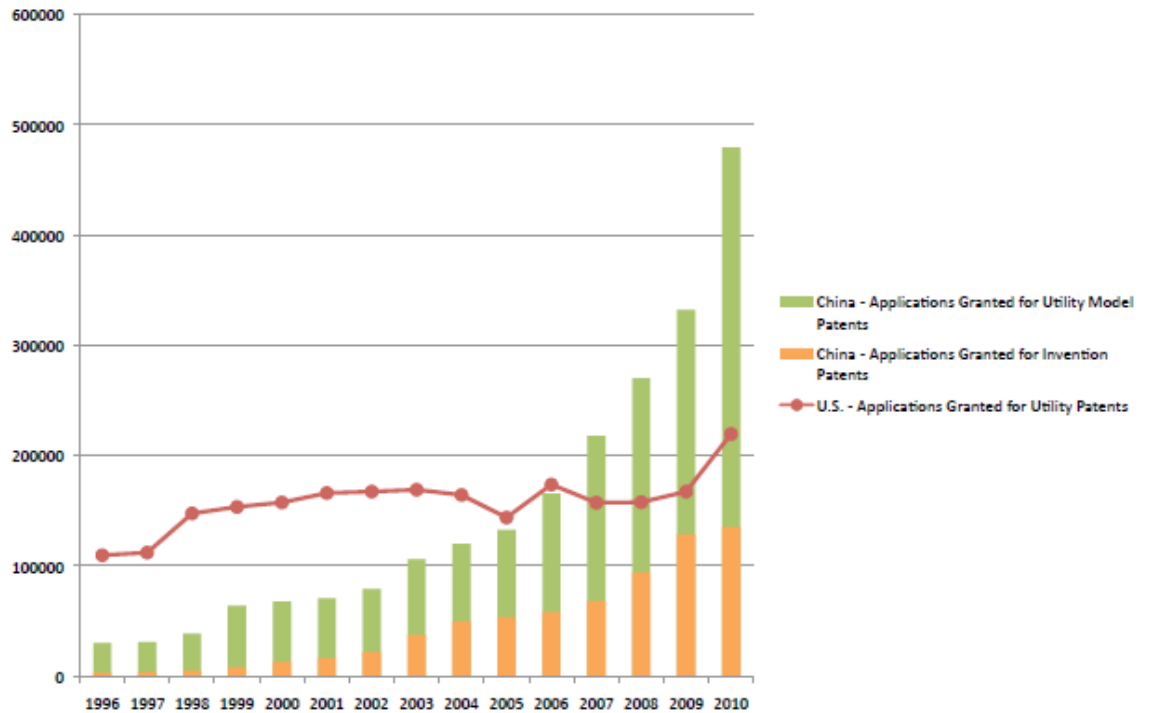
<sup>5</sup> Thomas Catan, “Web Video Rivalry Sparks U.S. Probe,” *The Wall Street Journal*, March 4, 2011.

<sup>6</sup> *Kingsdown Medical Consultants v. Hollister*, 863 F.2d 867,874 (Fed. Cir. 1988).

<sup>7</sup> Bruno van Pottelsberghe de la Potterie, *The Quality Factor in Patents Systems, Industrial and Corporate Change*, forthcoming; draft available at [http://econpapers.repec.org/paper/ecawpaper/2013\\_2f59650.htm](http://econpapers.repec.org/paper/ecawpaper/2013_2f59650.htm)

China appears to have adopted the U.S. predilection for large numbers of low-quality patents but on its own terms: a vastitude of inexpensive “utility model” patents that have a lower threshold of inventiveness and do not undergo an examination before they are issued. As the chart below shows, China granted 480,000 patents last year (design patents excluded), while the U.S. granted 220,000. Most of the rise in China comes from utility model patents.

**Total Non-Design Patents Granted by China and U.S., 1996-2010**



But consider the overall U.S. figures, which show a 31 percent jump over 2009. How did this happen? The USPTO claims greater efficiency is the reason – and that rejections increased, too, but since rejections are never final in the U.S., this is not a comforting answer.

### The Long-Term Agenda

The new FTC report reaffirms in greater detail the dramatically contrasting industry experiences with the patent system. It makes a clear distinction between “ex ante transactions” in which technology is actually transferred from a patent owner to a willing licensee and “ex post transactions” in which the patent owner demands fees from those who have independently developed the technology. Technology transfer promotes innovation, but ex-post transactions burden innovators who develop the technology independently and offer an incentive for the filing of trivial patents in the

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hopes of tripping up producers, distributors, and retailers of real products and services.

In principle, patents serve as an incentive to disclose in exchange for a limited term of exclusivity. In practice, the system works to hide information before a patented is granted and to allow the patentee to then capitalize on incomplete and unbalanced information in the market.

The FTC report recognizes that innovation is a complex process and that a particular patented invention may play only a minor role. It holds out hope that refining the calculation of damages may allow the patent system to be more responsive to different technological and market environments, but it also acknowledges that failure to align effective disclosure with the assertion of patents may ultimately call for an independent invention defense. A recent study shows that copying is rarely alleged in patent cases, especially those involving information technology.<sup>8</sup> Allowing independent invention would make patent law more like copyright, which requires copying as an element of infringement and, in the case of software, is widely accepted as an appropriate and workable regime.

As new questions are raised about how patents are granted and used, it becomes important to ensure that patents consistently promote innovation rather than strategic rent-seeking and lucrative work for agents and intermediaries. If national systems enable strategic behavior that favors certain interests, other national systems are justified in designing their patents systems to serve their own interests. An opaque, high-overhead single-size system may work well for some, and those that benefit will undoubtedly fight to keep it as it is. But if the patent system is to optimize innovation, it must operate with the respect of a growing diversity of innovators.

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<sup>8</sup> See Christopher Anthony Cotropia and Mark A. Lemley, Copying in Patent Law. North Carolina Law Review, Vol. 87, p. 1421, 2009; Stanford Public Law Working Paper No. 1270160. Available at SSRN: <http://ssrn.com/abstract=1270160>