



Common and Uncommon Knowledge: Reducing Conflict between Standards and Patents

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ABSTRACT: As standards have become critical for advancing technology and new markets, patents have become easier to obtain, more potent, and readily available for software and business methods. A low threshold of inventiveness and the growing opacity of the patent system has made inadvertent infringement commonplace, dramatically increasing opportunities for “patent trolls” to threaten information technology (IT) standards. Because IT standards have much the same investment rationale as most forms of intellectual property, standards that meet minimum requirements should be accorded protection from patent predators. Patent holders should assert their rights promptly or waive the opportunity to sue those who merely practice a public standard.

In March of 2007, Alcatel-Lucent won a record \$1.52 billion patent infringement jury verdict against Microsoft. The award was not about cutting edge technology but rather Microsoft’s implementation of MP3, a universal audio encoding standard developed in the early 1990s. In 1994, Microsoft licensed patents underlying the MP3 standard for \$16 million from the Fraunhofer Institute¹, only to discover 13 years later that it owed someone else nearly 100 times as much for other MP3-related patents. It demonstrates how vulnerable companies adhering to global industry standards have become to attacks from patent holders who do not participate in developing or setting the standard. This critical structural problem has not been addressed in the current debate over patent reform.²

It is remarkable how little policy-level attention is accorded standards given their strategic importance to the IT sector—and given the importance of the IT sector to innovation, economic growth, and national competitiveness. IT standards do not merely serve traditional standards goals such as safety, minimum performance, uniformity, or simple plug-to-socket compatibility. They are platforms for advancing technology and creating markets—well-known, well-defined tides that lift many boats. They are essential architectural elements for complex information systems and infrastructure. Standards assure buyers that they are investing in technology that works with and adds value to other investments, value that will not disappear at the whim of a particular vendor.

The time-critical, market-making nature of IT standards has inspired a variety of alliances and consortia as alternatives to formal standards development organizations. These entities do not seek accreditation from the American National Standards Institute (ANSI). Open to international participation, they look to the global IT marketplace, which does not fit with the nationally based framework for *de jure* standards. They often forego formalities in favor of speed and flexibility.

While other countries participate directly in international standards organizations – such as the International Organization for Standardization (ISO) or the International Telecommunications Union (ITU) – through national agencies, the U.S. participates through ANSI, a private organization. Members of ANSI include the National Institute for Standards and Technology (NIST) and other government agencies, along with private companies and associations. The U.S. Government’s involvement in standards is therefore indirect, less formal and more laissez-faire than that of other developed countries. IT standards-setting is further insulated from U.S. policymaking by virtue of its market orientation and global scope. Although many IT standards are still developed or validated through official channels, IT standards development as a whole, vast and important as it is, is fragmented and lacks a political constituency.

Even within firms, IT standards activities are often widely dispersed among operating divisions. Despite rising awareness of the strategic importance of leadership in setting standards, there is seldom a natural locus for addressing standards as a matter of corporate strategy or policy (in marked contrast to patents, which are managed as a specialty area within the legal department). Standards suffer from their history and reputation as common denominators in a world where market presence and competitive strength have historically been defined by differentiation and single-firm control. Upper management has little interest in standards.

Yet in IT, standards are essential to technological and economic progress. Innovations are cumulative, building on each other and on the shared systems and ecologies in which they participate. In a world where lock-in and stranded investments are notorious, customers want assurance that they can connect and use components from a wide choice of contractors and vendors.

The Paradigm of Complementarity

The Internet's spectacular success attests to the value of open standards as platforms for innovation. Anyone was free to build on the Internet's openly available nonproprietary protocols—no permission required. This openness spurred rapid innovation in products and services on a vast, unprecedented scale. Indeed, no single company had the resources, ingenuity, and entrepreneurship to develop the Internet as we know it.

Just as a common language makes possible the richness of literature, a common technological platform makes possible a wealth of implementations. If the platform is to be recognized as open rather than controlled by particular private interests, defining the platform is necessarily a group process. Implementers and users also need to be concerned about how the standard will evolve in the future, given that IT standards often continue to evolve as surrounding technologies change. Even if a standard is nominally royalty-free, a patent holder may confine the license to the practicing of the standard strictly as written, constraining further evolution of the standard.

If the common platform is relatively simple and abstract, as may be the case for an interface specification, a format, or a protocol, it may be free of patents. A complex compression program containing many functional elements is likely to include many patented processes. A patent pool may be needed to assemble a marketable package so that implementers do not have to face patent holders one by one. The pool for MPEG-2 video compression, for example, includes 102 U.S. patents plus hundreds of similar patents issued by other countries.

Patents and Standards

A good standard may be largely invisible because it is taken for granted. Its value stems from its commonality and ubiquity – not its exclusivity or scarcity as in the case of conventional goods. Companies rely on standards as much as they rely on their wholly owned property. Yet despite their role in generating future revenue, standards cannot be treated as assets because they cannot be controlled or traded.

By contrast, patents have gained much attention as intangible assets that can be controlled, traded, licensed, securitized, and collateralized. Yet a patent is only a right to exclude, not a right to exploit. The ability to exploit the patented technology may depend on an underlying patent that belongs to someone else and may or may not be available for licensing. In the U.S., patented technology cannot even be tested without the patent holder's permission. Further, the patent is only valid if it is in fact novel. Innovation in IT, especially in software, is so prolific that "prior art" missed by the patent examiner may surface at anytime and invalidate the patent.

Twenty years ago, simple specifications rarely involved patented technology. Since then, the patent-specialized Court of Appeals for the Federal Circuit has abolished limitations on patentable subject matter and lowered standards of patentability. While standards have assumed unprecedented importance in digital technology, patents have become easier to acquire, more versatile, and more powerful. Furthermore, the growth of standards-dependent investments has encouraged patent applicants to use creative tactics to track and capture emerging standards.

These changes enable "patent trolls" (best defined by a business model of "being infringed"³) to extract large settlements from companies with products on the market. The possibility of an injunction means that producers risk having to shut down an entire product line if a single patented function (among the tens of thousands of functions in a complex IT product) is found to infringe. Although this risk has been lowered since the Supreme Court struck down

the Federal Circuit's automatic injunction rule in *eBay v. MercExchange*, the possibility of an injunction enables the patent holder to seek a settlement far beyond the original value of the patented technology.

For patented technology embedded in standards, the economic risk is far worse. Not only is the standard likely to be deeply embedded and impractical to excise, it will be implemented widely, perhaps by every firm in the global market. Since all implementations, including downstream uses, are potential targets, the incentives to ambush are high. A patent infringed by an adopted standard becomes far more valuable in time than it would have been had the standards developers known about it when they had the ability to work around it.

Could the standards developers have searched for the patent, found it, and designed around it in the first place? Possibly, but the cost would have been enormous and risks would remain. Panelists in the 2002 FTC hearings on patents and innovation indicated that even large companies had abandoned product clearances because they were not cost-effective.⁴ Relevant patents must first be identified, no small task in an IT product that may contain tens of thousands of possibly patentable functions and components. In 2005, validity opinions cost an average of \$13,000. A further opinion on whether a particular component or process infringes a particular patent costs another \$13,000.⁵ Even if all issued patents and published patent applications that might affect the product could be identified, unpublished applications will be missed. On the other hand, many IT patents are ultimately invalid because there is prior art out there somewhere, even though it may be difficult to find. Knowing this, it does not make much sense to expend vast resources to get a legal opinion every function and component.

Participants in standards-setting efforts are commonly asked to disclose patents that might be relevant to the standard under discussion. However, many companies are reluctant to commit to full disclosure. As Frederick J. Telecky of Texas Instruments (TI) explained:

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.⁶

By the same token, however, it is unreasonable to expect a voluntary standards effort to figure out the potential effect of thousands of patents that may be held by companies inside or outside the process—especially when it is impossible to identify unpublished or yet-to-be-filed applications. The low standards of inventiveness combined with the richness of the technology means that there are far too many questionable patents out there, and the special penalties for willful infringement discourage innovators from looking.⁷

In addition to having made patents more potent, more plentiful, and difficult to defeat, the Federal Circuit has favored patent holders against standards development efforts. It has held that a duty of good faith cannot be implied and that disclosure obligations should be narrowly construed.⁸ Astoundingly, the Federal Circuit has even endorsed amending applications to deliberately capture the work of others:

[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.⁹

Standards organizations try to mitigate potential problems by asking all participants to agree to license on reasonable and nondiscriminatory terms (RAND) any of their patents that may be needed to practice the standard. However, standards organizations are technically oriented; they lack the will and capacity to oversee or enforce this requirement. The patent holder is free to negotiate licensing terms privately, licensee-by-licensee, according to its own interpretation of "reasonable" without publicly disclosing the terms. Under these circumstances, individual licensees are unlikely to take the patent holder to court.

Markets for standards should be robust and transparent – no less than other markets. All the issues—technology, price, license terms—should be on the table in a timely manner, just as they are for other business decisions. Developers of standards quite reasonably want to know the cost differential between competing approaches, along with any differences in licensing terms and conditions. This *ex ante* licensing would help participants reach decisions that make business sense and avoid the uncertainties and possible abuses of RAND licensing. A recent report by the Federal Trade Commission and the Department of Justice argues that *ex ante* licensing can be pro-competitive and should not be considered a *per se* antitrust violation – an excuse that standards organizations have used to avoid the problem.¹⁰

However, neither a RAND commitment nor *ex ante* licensing is effective against patent holders outside the standards-setting process. Non-participants are not bound by any disclosure or licensing commitments. Once the standard is chosen and many firms have embedded it in products that have been designed, manufactured, and widely distributed, the “highest and best use” of the patent from the patent holder’s perspective will be to extract (or “extort”) as much as possible of the sunk investments that inadvertently infringe the patent.

Opportunities for conflict and ambush have increased, as both standards and patents have expanded in scope and significance. But while standards are disciplined by the market, patents have proliferated by legislative, judicial, and administrative fiat. The 1952 Patent Act framed patents as an entitlement that had to be allowed unless the examiner could show that the subject matter was obvious to a person having ordinary skill in the art. This threshold was further lowered by the Court of Appeals for the Federal Circuit, which made it difficult to show that new combinations of known elements are obvious,¹¹ exalted secondary factors that favored nonobviousness, and enhanced the presumption of validity, making it difficult to convince a jury that granted patents are obviousness.

In addition to creating legal stumbling blocks for other innovators, low-quality patents dilute the value of patents for conveying knowledge. Patent documents may be available for free on the Internet, but on the whole, low-quality patents raise more questions than they answer. Unlike spam, patents cannot be ignored or deleted.

In contrast to the murky patent landscape, standards development demands highly focused and explicit communication and generation of specific knowledge that is easy to understand, test, and implement. The need for certainty and economy argues against duplicative, potentially incompatible standards-setting efforts. The process must produce, validate, and publicize useful information. The value of a standard is affirmed when multiple firms adopt and implement it successfully.

Standards as an Asset

The invisibility of economic value in today’s economy is not unique to standards. It is partly expressed by the “intangibles” problem, as measured in the growing discrepancy between a firm’s stock market valuation and the much lower value of the asset base on the corporate books. “Intangible assets” are not authoritatively defined, but they usually include intellectual property, R&D, human capital, customer relations, institutional knowledge, business processes, and custom software. The very limited ability of the firm to trade, control, exploit, or monetize these assets makes it difficult to assign them a dollar value. In many cases, the economic value is speculative or contingent. Or it may be derived from sources, relationships, and emerging opportunities outside the firm.

Standards are shared intangible assets for a market segment, an entire industry, or even multiple industries. A standard may promise a large future market for new technology, products, and services, although this depends on who is pushing the standard, unforeseen technological advances, and competition from other standards and technologies. Standards are essential but beyond the control of the users – much like the rule of law, economic stability, and political freedom.

Now consider the value of the standard from the point of view of the owner of a patent that has been inadvertently embedded in a complex product. Holding up deep-pocketed companies like Microsoft is, in real estate parlance, “the

highest and best use” of the patent. The private value that can be realized from the patent is roughly equal to the staggering costs that can be imposed on the rest of the world.

The patent holder can realize this opportunity by avoiding full disclosure within the standards process, but that’s risky as the Dell and Rambus cases have shown¹² – or by not participating at all and “getting lucky.” Non-participants have no obligation to disclose patents and so no obligation to license at all, RAND or otherwise. By surreptitiously tracking deliberations of a standards process, perhaps through an ally inside the process, a non-participant can shape a patent application to capture the standard. Sadly, the more open the process, the more information will spread to nonparticipants and the more vulnerable the standard will be.

The value of a standard is in its ubiquity, but that is also a measure of its vulnerability. Hidden patents can undermine the rational business expectations of millions of integrators, packagers, resellers, service producers, and users – including users of complementary products and services and all the way down the value chain. Although patents are touted as an incentive to investment, the irony is that they can also undermine legitimate market-oriented investments by encouraging investment in arbitrage and extortion. The result is a systemic bias against open collaborative innovation and in favor of bad faith behavior and legal maneuvering. All the more remarkably, this is happening in a sector in which the value of individual patents is greatly diluted by numbers and generally considered secondary to other means of securing returns from innovation, such as first-mover advantages.

Reforms to mitigate the threat of extortion in the IT sector have been opposed by industries (biotech, pharma) in which individual patents are extremely important—and by the patent bar, which has an economic interest in keeping patents as powerful and plentiful as possible.

Just as patents are uniquely important to the pharmaceutical industry, standards are uniquely important to the IT sector. Yet IT standards are so critical, so time-sensitive, so market-oriented and strategic that they do not fit well within the traditional institutional model. Because so many IT standards are developed outside the formal international standards system, the IT sector is politically underrepresented within the system. No organization represents the business and policy interests of the many IT standards entities not accredited by ANSI. With little coordination among standards organizations, there has been no collective response to the problem of participants who act in bad faith, let alone the problem of ambush by non-participants.

There is no recognized domain for standards law or standards policy. Standards setting remains largely a function of the engineering community with only an attenuated relationship to business strategy and corporate policy.

The fragmentation and institutional weakness of the IT standards enterprise is especially striking in the face of a deeply institutionalized patent system. IT standards are increasingly hostage to a one-size-fits-all patent system that defies empirical observation and, while professedly “unitary,” leads to discriminatory results. The emerging cottage industry in ambush and extortion preys not only on IT companies but on the benefits that IT brings to every sector in the economy. If IT wants reform, it must seek reform of the entire patent system—against the wishes of deeply invested and motivated interests who believe that any diminishment of patent power and scope will impact their bottom line. In effect, the system cross-subsidizes industries where patents work well at the expense of those where patents work poorly.

The limited monopoly of patents is intended to promote public disclosure of new knowledge. This requires that patent information be timely, clear, and significant. In reality, it is delayed, opaque, of indeterminate value, as well as a source of potential liability for willful infringement. How credible is the content? Patents are negotiated privately between the applicant’s patent attorney and a government employee, and the applicant is entitled to patent unless the examiner can show otherwise. There is no requirement for a working model or evidence that the technology performs as claimed. Even with publication after 18 months, there is virtually no third-party input into the examination process.

By contrast, the development of open standards occurs only if there is a shared, focused conviction that a standard is worth investigating, negotiating, and implementing. The inputs and outcomes in IT standards are subject to constant

scrutiny and testing through expert deliberation, reference models, conformance testing, competing implementations, and commercial use. The information and knowledge in standards is documented by and for those who will use it for its intended purpose, unmediated by lawyers.

Encouraging and protecting investment has become the principal rationale of intellectual property and IT standards. Standards-driven investments are all the greater because they are multiplied across companies and extend down value chains and across networks of complementary products and services. Open standards processes ensure the quality and accessibility of the knowledge behind the standard. Open licensing ensures the broadest and deepest use and reliance on the standard, and therefore the greatest possible investment. Yet the more open the process and the more open the licensing, the more vulnerable the standard is.

Patents and standards both create investment-backed expectations that merit recognition as property. As the final report of the National Innovation Initiative of the Council on Competitiveness observes: “From an intellectual property perspective, open and proprietary IP models should not be seen as mutually exclusive; rather the IP framework must enable both approaches.”¹³ The burdens of disclosing and learning about potential conflicts should be managed so that standards and patents work productively together rather than as two insular systems, one run by engineers and the other by lawyers.

Aligning Patents and Open Standards

Today, patent holders have all the cards, while those invested in standards face unknown and unforeseeable patent landmines. Yet standards deserve protection by virtue of the great investments needed to make IT products, systems, and infrastructure work as users expect.

One approach to the problem would be to raise the threshold of “nonobviousness” beyond the “person having ordinary skill in the art” to a proper expert standard – and apply the standard under peer review as suggested by the current peer-to-patent experiment.¹⁴ This should be augmented, as pending reform legislation proposes, by limiting “willful infringement” penalties so that innovators are not discouraged from reading patents. Peer review would ensure that patents embody major advances rather than trivial improvements. Experts working together to develop baseline standards could then be reasonably confident that they would not accidentally infringe on third-party patents.

This approach would solve much more than the problem of standards ambush, but by the same token, it would be difficult to achieve. Patents are rationalized by scale of investment, rather than genuine invention, and there is widespread addiction to a volume-driven patent system. Any attempt to substantially reduce the volume of IT patents would meet with great resistance from patent departments and law firms.¹⁵

A more realistic approach would address standards specifically as an exception to the power of the patent holder to extract damages and enjoin unwitting infringers. Patents are uniquely powerful against standards. If patent holders are endowed with power to threaten investments on this scale, they should at least be obliged to make their rights known in a timely manner. If not, they should lose the ability to sue those who do no more than practice an open standard. It is far more efficient to put patentees, who presumably know the field in which they are patenting, on notice of a relatively small number of open standards than to put multitudes of implementers and users on notice of multitudes of patents.

Like *ex ante* licensing and patent disclosure by participants, clearing standards against ambush would add to the transparency and efficiency of the market. It would encourage participation in standards development processes by patent holders who might otherwise keep their distance in hopes of being infringed. It would limit the incentives for patent applicants to monitor processes and amend applications to capture emerging standards.

Of course, a clearing mechanism would apply only to standards that meet threshold criteria of openness such that patent holders could be charged with constructive notice – recognizing that the more open the process, the more vulnerable the standard will be to capture by unscrupulous patent applicants. Since the standards development processes of the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C) are already public to large degree, they would be open enough to qualify as protected standards. It could reasonably be required that qualifying processes register in central location to be assured of protection.

This clearance mechanism is little more than a tailored application of the venerable legal doctrine of *laches*. That is, people should not sit on their rights, idly or cunningly, while others rely on this inaction to make substantial investments.

The danger of individual patents holding standards hostage is a growing concern shared by businesses and consumers. IBM has circulated a “safe harbor” proposal explaining the incentives for the patent holder to refrain from acting until standards are deeply embedded and widely adopted – and pointing to *laches* as a partial solution.¹⁶ The Consumer Project on Technology’s “Proposed WIPO Protocol for the Development of Open Standards” similarly offers a formal international procedure for protecting standards from ambush.¹⁷

Conclusion

Investors in innovation deserve a transparent and straightforward legal environment. In today’s knowledge-based economy, we need to encourage and protect investments in IT standards as well as conventional forms of intellectual property. An entire industry, all sectors of the economy, and hundreds of millions of end users depend on standards. Following the lead of the National Innovation Initiative, we should recognize that open or public intellectual property is no less worthy of protection than property controlled by a single entity and that those who misappropriate public property infringe on everyone – innovators, producers, and users, large and small.

About the Author

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¹ Douglas Heingartner, “Patent Fights Are a Legacy of MP3’s tangled origins,” *New York Times* (March 5, 2007). Available at <http://www.nytimes.com/2007/03/05/technology/05music.html?ei=5090&en=72ad80392c70cd63&ex=1330750800&partner=rssuserland&emc=rss&pagewanted=print>.

² The verdict became a poster child for a more structured approach to calculating damages, a prominent but controversial issue in patent reform. However, the judge threw out the award for damages in August 2007, six months after the original jury verdict.

³ Markus G. Reitzig et al., “On Sharks, Trolls, and Other Patent Animals – ‘Being Infringed’ as a Normatively Induced Innovation Exploitation Strategy,” working paper (February, 2006). Available at <http://ssrn.com/abstract=885914>.

⁴ <http://www.ftc.gov/opp/intellect/index.shtm>. According to Robert Barr, Vice President and Worldwide Patent Counsel, Cisco Systems, Inc., “[T]here are too many patents to be able to even locate which ones are problematic. I used to say only IBM does clearance searches... but IBM tells me even they don’t do clearance searches anymore.” Transcript, October 30, 2002, <http://www.ftc.gov/opp/intellect/021030trans.pdf>.

⁵ American Intellectual Property Law Association (AIPLA), “Report of the Economy Survey” (2005).

⁶ 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>.

⁷ A recent Federal Circuit decision, *In re Seagate Technology LLC*, Misc. Docket 830, cuts back on willful infringement somewhat by eliminating the need to get an outside attorney's opinion once a company has learned of a patent that it may infringe; available at <http://www.fedcir.gov/opinions/M830.pdf>.

⁸ *Rambus v. Infineon*, 318 F.3d 1081 (Fed. Cir. 2003).

⁹ *Kingsdown Medical Consultants v. Hollister*, 863 F.2d 867,874 (Fed. Cir. 1988).

¹⁰ U.S. Department of Justice and Federal Trade Commission, "Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition" (2007) pp. 49-56.

¹¹ The so-called "teaching-suggestion-motivation test" for combinations was recently overruled by the Supreme Court in *KSR v. Teleflex*, 550 U.S. ___, 127 S. Ct. 1727 (2007).

¹² See FTC releases at <http://www.ftc.gov/opa/1995/11/dell.shtml> and <http://www.ftc.gov/opa/2006/08/rambus.shtm>

¹³ Council on Competitiveness, "Innovate America, Thriving in a World of Challenge and Change," National Innovation Initiative Summit and Report (December, 2004) 44.

¹⁴ Beth Simone Noveck, "Peer to Patent: Collective Intelligence and Intellectual Property Reform," 20 Harv. J. L & Tech. 123 (2006).

¹⁵ The organized patent bar has invariably argued for a lower threshold of nonobviousness. See amicus briefs in the seminal cases of *Graham v. John Deere* and *KSR International v. Teleflex*.

¹⁶ IBM Issue Paper, "Toward an Open Standards Based Innovation Economy," 2005.

¹⁷ Consumer Project on Technology, "Proposed WIPO Protocol for the Development of Open Standards (PDOS) Version 1.0" [2005] Available at <http://www.cptech.org/a2k/pdos.doc>. The Consumer Project on Technology has since become Knowledge Ecology International.