

Report for Congress

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Innovation, Intellectual Property, and Industry Standards

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Summary

An “industry standard” is a set of technical specifications that provides a common design for a product or process. Relating to products ranging from typewriter keyboards to high technology computer protocols, standards are pervasive in the modern economy. Standards sometimes arise through government action or through the operation of the marketplace. However, private industry groups called standards bodies have long been active in promulgating standards.

Standards bodies and their members have encountered a growing number of claims that a privately held “intellectual property right” — such as a copyright or patent — covers an industry standard. Most of these assertions have involved patents. If the patent is valid and enforceable, it is possible that the standard cannot be employed without infringing that patent.

Striking a balance between open industry standards, on one hand, and exclusive intellectual property rights, on the other, is an important component of contemporary industrial policy. Industry standards potentially bring economic benefits ranging from a broad range of interoperable products to more robust, competitive markets. In turn, intellectual property rights may promote innovation, the disclosure of new inventions and technology transfer. Conflicts between industry standards and intellectual property rights require a careful weighing of these competing interests.

Aware of potential conflicts between industry standards and intellectual property rights, many standards bodies have enacted intellectual property polices. Although these policies vary, they generally require that members of the standards body (1) disclose intellectual property that is pertinent to a proposed standard and (2) license the intellectual property to others, often on “reasonable and nondiscriminatory” terms. Past litigation and governmental agency actions have involved cases where a member of a standards body allegedly did not abide by these obligations. Various legal doctrines, including contract law, fraud, equitable estoppel and antitrust law, have been employed to compel the observance of disclosure and licensing commitments. However, some uncertainty surrounds the enforceability of the intellectual property polices of standards bodies, particularly against individuals and firms that were not members of the group that promulgated the standard.

Should Congress have an interest in this area, several options present themselves. No action need be taken if the current relationship between industry standards and intellectual property is deemed satisfactory, particularly as standards bodies become increasingly aware of intellectual property and as the growing number of judicial precedents may make the legal situation clearer. Congress might also encourage the development of model intellectual property disclosure and licensing obligations for use by standards bodies; assist standards bodies in identifying intellectual property that pertains to a proposed standard; and, as a possible more far-reaching legal reform, encourage proprietors to disclose intellectual properties that bear upon proposed industry standards.

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Innovation, Intellectual Property, and Industry Standards

Virtually every participant in the modern economy is familiar with the concept of an industry standard: a set of technical specifications that provides a common design for a product or process.¹ For example, electrical plugs and outlets ordinarily conform to a standard voltage, impedance and plug shape. In the absence of such specifications, consumers might face significant difficulties in obtaining safe and functional products. The contemporary marketplace provides countless other examples of standardized products, ranging from typewriter keyboards, to automobile transmissions, to Internet connection protocols. Commentator James Surowiecki has concluded that standards are so significant that “without standardization there wouldn’t be a modern economy.”²

Standards come into existence through a number of mechanisms, including the operation of the marketplace and government regulation.³ Another principal vehicle for standard formation is the activity of a standards body. A standards body — sometimes termed a “standards setting organization” or “standards developing organization”⁴ — is a private industry group that sets standards for its members.⁵ As the U.S. economy becomes more oriented towards networked information technologies, the number of standards bodies has increased in recent years.⁶ Many large high technology firms are members of dozens of standards bodies.⁷

Standards bodies and their members have increasingly encountered claims that an intellectual property right — such as a patent or copyright — covers an industry

¹Mark A. Lemley, “Intellectual Property Rights and Standard-Setting Organizations,” 90 *California Law Review* (2002), 1889.

²James Surowiecki, “Turn of the Century,” *Wired* (Jan. 2002), 85.

³David M. Schenck, “Setting the Standard: Problems Presented to Patent Holders Participating in the Creation of Industry Uniformity Standards,” 20 *Hastings Communications & Entertainment Law Journal* (1998), 641.

⁴Maurits Dolmans, “Standards for Standards,” 26 *Fordham International Law Journal* (2002), 163.

⁵Janice M. Mueller, “Patent Misuse Through the Capture of Industry Standards,” 17 *Berkeley Technology Law Journal* (2002), 623.

⁶Timothy Baumann, “As Standards Proliferate, So Too a Rise in Defendants Asserting ‘Standards Abuse,’” 2 *Patent Strategy & Management* (June 2001), 1.

⁷Lemley, *supra* note 1, at 1907.

standard.⁸ For example, a telecommunications standards body might develop a standard relating to cellular telephones while under the impression that no intellectual property rights cover that standard. When a patent owner later informs members of the telecommunications industry that their phones use a proprietary technology, a potential conflict arises. If an intellectual property right is valid and enforceable, its owner may possess the ability to prevent others from employing the standard altogether.⁹ On the other hand, because license fees are often paid to owners of intellectual property that is incorporated into a standard, standards may provide significant incentives for firms to innovate and to permit the use of a patented invention within a standard.¹⁰

The intersection of industry standards and intellectual property is of particular significance to entrepreneurs and small firms. On one hand, these entities may be especially reliant upon intellectual property rights in order to capture the benefits of their innovations.¹¹ On the other, industry standards may particularly advantage individuals and small companies. Standards can ensure that new products are compatible with established ones, allowing small entities to access a larger user base than they might otherwise enjoy.¹² More generally, the interaction between industry standards and intellectual property is an important consideration in the modern economy, determining whether members of the public are free to use the standard or not; whether products can be built to the standard when multiple intellectual property rights apply; and whether a climate favorable to innovation is preserved.¹³

This report considers the impact of industry standards and intellectual property law upon innovation. This report first introduces the fundamentals of industry standards, standards bodies, and the intellectual property laws. It then explains potential conflicts between industry standards and proprietary intellectual property rights and explores legal responses to these conflicts. This report closes with an overview of legislative issues and options for addressing intellectual property rights and industry standards.

⁸See Baumann, *supra* note 6.

⁹See *infra* notes 66-69 and accompanying text.

¹⁰National Research Council, National Academy of Sciences, *Standards, Conformity Assessment and Trade: Into the 21st Century* (National Academy Press, Washington, DC 1995), 32-33.

¹¹Sally Wyatt & Gilles Y. Bertin, "Multinationals and Intellectual Property" (Harvester 1988), 139.

¹²Joseph Farrell, "Standardization and Intellectual Property," 30 *Jurimetrics Journal* (1989), 35.

¹³Lemley, *supra* note 1.

Fundamentals of Standards and Standards Bodies

The Impact of Standardization

Standards are ubiquitous in the modern U.S. economy.¹⁴ For example, products ranging from soda cans to light bulbs to batteries come in standard sizes; consumers routinely fax documents to each other using fax machines from different manufacturers; and typists easily switch from one QWERTY keyboard to another. Standards are so prevalent in the current U.S. marketplace that the absence of standardization sometimes surprises consumers. Computer users who transfer files between “Word” and “Word Perfect,” for example, may unexpectedly discover the lack of interoperability between data storage protocols of these competing word processing software packages

Many benefits may result from the use of standards. Standards may convey information about the product, regulate quality, ensure compatibility and enhance competition.¹⁵ For example, foods labeled “low sodium” communicate the fact that their sodium content is below certain standards set by the federal government. Other sorts of standards, such as professional licensing requirements or safety codes, can improve public health and safety. One example is building codes, which guard against construction companies from fabricating dangerous housing.¹⁶ A standard that allows interoperability also facilitates the manufacturing and sale of new products by increasing both the likelihood of sufficient volume of business for manufacturers, and of a sufficient range of interoperable products for consumers. Standards can also lead to a robust, competitive market for replacement parts or product maintenance.¹⁷

The benefit of standards is most noticeable in markets that exhibit network effects.¹⁸ In such markets, the value of a product is a function of how many other consumers use a compatible product.¹⁹ A classic example is the telephone system, where the worth of the system may be measured by the total number of subscribers.²⁰ Suppose, for example, that two mutually exclusive telephone networks serve a

¹⁴Margaret Jane Radin, “Online Standardization and the Integration of Text and Machine,” 70 *Fordham Law Review* (2002), 1125.

¹⁵Sean P. Gates, “Standards, Innovation, and Antitrust: Integrating Innovation Concerns Into the Analysis of Collaborative Standard Setting,” 47 *Emory Law Journal* (1998), 583.

¹⁶Robert W. Hamilton, “Prospects for the Nongovernmental Development of Regulatory Standards,” 32 *American University Law Review* (1983), 455.

¹⁷Lemley, *supra* note 1.

¹⁸Mark A. Lemley & David McGowan, “Legal Implications of Network Economic Effects,” 86 *California Law Review* (1998), 479.

¹⁹Gregory J. Werden, “Network Effects and Conditions of Entry: Lessons from the Microsoft Case,” 69 *Antitrust Law Journal* 87 (2001).

²⁰Michael A. Carrier, “Unraveling the Patent-Antitrust Paradox,” 150 *University of Pennsylvania Law Review* (2002), 761.

particular town. New residents to the town must choose one telephone network or the other. A rational newcomer will ordinarily subscribe to the network with the larger subscriber base, so that he may call the greatest number of businesses and persons. As one network grows larger than the other over time, it is unlikely that both market entrants will survive. The market may eventually “tip” in favor of the larger network, likely resulting in a single “winner-take-all” telephone network in that town.²¹ Carol Shapiro and Hal Varian, economists at the University of California at Berkeley, cite the video recorder market (VHS vs. Beta) and personal computer operating markets (Apple vs. Windows) as examples of markets that eventually tipped in favor of a single, dominant entrant.²²

In markets driven by network effects, the availability of standards can support competition policy. Without a standard, a single firm would likely be the sole provider of a dominant network technology. Standards instead allow multiple firms to supply services and equipment, which may lower prices and lead to greater consumer choices.²³

Standards may also lead to negative economic consequences, however. Standardization can reduce competition by diminishing the ability of competitors to differentiate their products.²⁴ The specifications of a particular standard may make it harder for one firm to make a product better or cheaper, for example. Some standards may also increase circumstances of consumer “lock-in.”²⁵ Lock-in occurs when a consumer faces significant costs in switching from one technology to another. It is easy enough for a consumer to switch from a Ford to a Chevrolet automobile, for example, but changing computers from a Macintosh to a Windows-based machine may entail certain costs. The purchase of a different computer may require a consumer to purchase new software, buy a new printer and other hardware peripheral devices, convert text and other files, and in general become familiar with the new machine.²⁶ Standardized products may lead to such significant lock-in effects that consumers may be strongly discouraged from changing products, even where the new product is superior.

Similarly, standardization may also retard innovation.²⁷ Once a particular market achieves standardization, one firm may find that the introduction of an entirely new “system” is economically prohibitive. That firm might prefer to

²¹Michael L. Katz & Carl Shapiro, “Network Externalities, Competition, and Compatibility,” 75 *American Economic Review* (1985), 424.

²²Carl Shapiro & Hal Varian, *Information Rules* (Harvard Business School Press 1999), 173-79.

²³Robert Pitofsky, “Antitrust and Intellectual Property: Unresolved Issues at the Heart of the New Economy,” 16 *Berkeley Technology Law Journal* (2001), 535.

²⁴13 Herbert Hovencamp, *Antitrust Law* ¶ 2136 (1999).

²⁵Renato Mariotti, “Rethinking Software Tying,” 17 *Yale Journal of Regulation* (2000), 367.

²⁶Jay Dratler, Jr., “Microsoft as an Antitrust Target: IBM in Software?,” 25 *Southwestern University Law Review* (1996), 671.

²⁷Farrell, *supra* note 12, at 37.

introduce a better complementary component to an existing system, allowing it to take advantage of an established user base. As a result, standards could create an environment more receptive to incremental rather than pioneering innovation.²⁸

The Formation of Industry Standards

Product standardization can occur through three principal mechanisms: the operation of the marketplace, government intervention and private standards bodies.²⁹ First, consumers may gravitate toward one product and reject its competitors, resulting in a de facto standard.³⁰ As noted previously, de facto standardization is most common in markets that exhibit strong network effects, where there are large benefits from using the same product that everyone else does.³¹ Given the dominant market share of the Windows operating system, for example, consumers that opt for this system both gain access to an extensive array of compatible hardware and software, and find it easy to share information with others.

Second, the government sometimes sets obligatory standards.³² For example, the Federal Communications Commission dictates various standards for the electronic equipment used in the telecommunications and broadcasting industry. As a result of these standards, it is possible to receive signals broadcast by multiple television stations with the same television equipment across the country.³³

The third possibility is that members of industry agree on a standard through the auspices of a standards body.³⁴ A large number of standards bodies are active in the United States, featuring diverse organization structures. Some are standing entities, while others are formed on an ad hoc basis for the purpose of promulgating a single standard. Membership in some standards bodies is restricted, while other standards bodies are open to any interested party.

Although standards bodies employ varying procedures, in broad outline most standard bodies employ the following process. First, a proponent of a standard develops a technical specification that details the key points of a technology and preliminarily defines the scope of the intended standard. This specification is subject to commentary from members of the standards body and sometimes members of the

²⁸Joseph Farrell & Garth Saloner, "Competition, Compatibility, and Standards: The Economics of Horses, Penguins & Lemmings," in *Product Compatibility as a Competitive Strategy* (Gabel & Landis, ed., Amsterdam: North-Holland 1987), 1.

²⁹Lemley, *supra* note 1.

³⁰Mark R. Patterson, "Inventions, Industry standards, and Intellectual Property," 17 *Berkeley Technology Law Journal* (2002), 1043.

³¹See *supra* notes 18-25 and accompanying text.

³²Lemley, *supra* note 1.

³³Gates, *supra* note 15.

³⁴Michael G. Cowie & Joseph P. Lavelle, "Patents Covering Industry standards: The Risks to Enforceability Due to Conduct Before Standard-Setting Organizations," 30 *American Intellectual Property Law Association Quarterly Journal* (2002), 95.

public, often resulting in revisions to the proposed standard. Finally, an elected or appointed board gives final approval to the specification, raising it to the level of a standard.³⁵

No single entity, public or private, controls the U.S. standards development system. The private, nonprofit American National Standards Institute (“ANSI”) coordinates the efforts of many standards bodies, however. ANSI is an organization of firms, trade associations, technological societies, consumer organizations, and government agencies.³⁶ ANSI oversees the process of setting voluntary standards and ensures that an appropriate degree of consensus is reached with regard to the proposed standard. ANSI also ensures that access to the standards process, including an appeals mechanism, is made available to anyone directly or materially affected by a standard that is under development. ANSI further promotes the use of U.S. standards internationally, advocates U.S. policy and technical positions in international and regional standards organizations, and encourages the adoption of international standards as national standards where they meet the needs of the user community.³⁷

The National Institute of Standards and Technology (“NIST”) also promotes voluntary standard-setting in the United States.³⁸ NIST is a non-regulatory federal laboratory within the Technology Administration of the U.S. Department of Commerce. Serving as a technical contributor to the nation’s standards infrastructure, NIST laboratories develop more accurate ways to measure length, time, mass, temperature, and other physical quantities that are fundamental to standard-setting. NIST further supports voluntary standardization efforts by providing technical expertise and facilitating private sector agreement. NIST also coordinates the use of voluntary standards by federal agencies.³⁹

Fundamentals of Intellectual Property

The term “intellectual property” identifies a number of legal instruments, including copyrights, patents and trademarks, that provide innovators with proprietary interests in their intangible creations.⁴⁰ Copyright provides authors with exclusive rights in their writings, visual works and other works of authorship; patents protect inventors of products, processes and other useful inventions; while trademark

³⁵eWeek Magazine, “Path to Approval,” [http://www.eweek.com/image_popup/0,3662,s=702&iid=20053,00.asp].

³⁶American National Standards Institute, “About ANSI” at [<http://www.ansi.org/public/about.html>].

³⁷*Ibid.*

³⁸CRS Report 95-30, *The National Institute of Standards and Technology: An Overview*, by (name #r edacted).

³⁹*Ibid.*

⁴⁰Roger E. Schechter & (name #r edacted), “Intellectual Property: The Law of Copyrights, Patents and Trademarks” (Thomson-West Group, St. Paul, Minnesota 2003), 1-2.

law concerns the identifying symbols used by merchants to identify their goods and services.⁴¹ Although industry standards potentially impact each of these legal disciplines, past controversies and current debate have focused upon patents.⁴² As a result, this report too will focus upon the patent law, although its broader discussion of the relationship between industry standards and intellectual property is applicable to copyrights, trademarks and other similar proprietary interests.

Patent Policy

By providing individuals with exclusive rights to their inventive products and processes, the patent law allows innovators to appropriate the economic benefits of their discoveries. Absent a patent system, competitors might readily be able to appropriate the benefits of an innovator's research and development efforts. Aware of these potential "free riders," firms might devote few, if any resources towards innovation. The patent law solves this market failure problem by providing economic incentives for individuals and institutions to engage in research and development.⁴³

The patent system is also said to encourage the disclosure of new technologies.⁴⁴ Each issued patent must include a description sufficient to enable skilled artisans to practice the patented invention.⁴⁵ Issued patents may also encourage others to "invent around" the patentee's proprietary interest. Others can build upon the patentee's disclosure to produce their own technologies that fall outside the exclusive rights associated with the patent.⁴⁶

Patent rights may also facilitate technology transfer.⁴⁷ Absent patent rights, an inventor may have no tangible asset to sell or license. In addition, an inventor might otherwise be unable to police the conduct of a contracting party. Any technology or know-how that has been disclosed to a prospective buyer might be appropriated without compensation to the inventor. The availability of patent protection decreases the ability of contracting parties to engage in opportunistic behavior. By lowering

⁴¹Gordon U. Sanford, III, "An Intellectual Property Roadmap: The Business Lawyer's Role in the Realm of Intellectual Property," 19 *Mississippi College Law Review* (1998), 177.

⁴²Lemley, *supra* note 1.

⁴³Simone Rose, "Patent 'Monopolyphobia': A Means of Extinguishing the Fountainhead?," 49 *Case W. Res. L. Rev.* 509 (1999).

⁴⁴Keith E. Maskus, "The Role of Intellectual Property Rights in Encouraging Foreign Direct Investment and Technology Transfer," 9 *Duke Journal of Comparative and International Law* (1998), 10.

⁴⁵35 U.S.C. § 112 (2000).

⁴⁶Rebecca S. Eisenberg, "Patents and the Progress of Science: Exclusive Rights and Experimental Use," 56 *University of Chicago Law Review* (1989), 1017.

⁴⁷Jonathan Eaton & Samuel J. Kortum, "Trade in Ideas: Patenting and Productivity in the OECD," 40 *Journal of International Economics* (1996), 251.

such transaction costs, the patent system may make technology-based transactions more feasible.⁴⁸

The patent system may also provide a more socially desirable outcome than its chief legal alternative, trade secret protection. Trade secrecy guards against the improper appropriation of valuable, commercially useful information that is the subject of reasonable measures to preserve its secrecy.⁴⁹ Taking the steps necessary to maintain secrecy, such as implementing physical security measures, imposes costs that may ultimately be unproductive for society.⁵⁰ Also, while the patent law obliges inventors to disclose their inventions to the public,⁵¹ trade secret protection requires firms to hold their protections in secret. The disclosure obligations of the patent system may better serve the goals of encouraging the diffusion of advanced technological knowledge.

The patent system has long been subject to criticism, however. Some observers believe that the patent system encourages industry concentration and presents a barrier to entry in some markets.⁵² Others believe that the patent system too frequently attracts speculators who prefer to acquire and enforce patents rather than engage in socially productive activity.⁵³ Still other commentators suggest that the patent system often converts pioneering inventors into technological suppressors, who use their patents to block subsequent improvements and thereby impede technical progress.⁵⁴

When analyzing these contending views, it is important to note the lack of rigorous analytical methods available for analyzing the effect of the patent law upon the U.S. economy as a whole. The relationship between innovation and patent rights remains poorly understood. Concerned observers simply do not know what market impacts would result from changing patent term from its current twenty-year period, for example.⁵⁵ Consequently, current economic and policy tools do not allow us to calibrate the patent system precisely in order to produce an optimal level of investment in innovation.

⁴⁸Robert P. Merges, "Intellectual Property and the Costs of Commercial Exchange: A Review Essay," 93 *Michigan Law Review* (1995), 1570.

⁴⁹American Law Institute, Restatement of Unfair Competition Third § 39 (1995).

⁵⁰David D. Friedman *et al.*, "Some Economics of Trade Secret Law," 5 *Journal of Economic Perspectives* (1991), 61.

⁵¹35 U.S.C. § 112 (2000).

⁵²(name redacted), "Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties," *University of Illinois Law Review* (2001), 305.

⁵³*Ibid.*

⁵⁴See Robert P. Merges & Richard R. Nelson, "On the Complex Economics of Patent Scope," 90 *Columbia Law Review* (1990), 839.

⁵⁵See F. Scott Kieff, "Property Rights and Property Rules for Commercializing Inventions," 85 *Minnesota Law Review* (2001), 697.

Patent Acquisition and Enforcement

Patent rights do not arise automatically. Inventors must prepare and submit applications to the U.S. Patent and Trademark Office (“USPTO”) if they wish to obtain patent protection.⁵⁶ USPTO officials known as examiners then assess whether the application merits the award of a patent.⁵⁷

In deciding whether to approve a patent application, a USPTO examiner will consider whether the submitted application fully discloses and distinctly claims the invention.⁵⁸ In addition, the application must disclose the “best mode,” or preferred way, that the applicant knows to practice the invention.⁵⁹ The examiner will also determine whether the invention itself fulfills certain substantive standards set by the patent statute. To be patentable, an invention must be useful, novel and nonobvious. The requirement of usefulness, or utility, is satisfied if the invention is operable and provides a tangible benefit.⁶⁰ To be judged novel, the invention must not be fully anticipated by a prior patent, publication or other knowledge within the public domain.⁶¹ A nonobvious invention must not have been readily within the ordinary skills of a competent artisan at the time the invention was made.⁶²

The USPTO publishes most pending patent applications approximately 18 months after they are filed.⁶³ For example, if an inventor filed a patent application on August 1, 2003, then the USPTO will make that application available to the public on or after February 1, 2005. Pre-grant publication of patent applications potentially alerts interested parties of the possibility that patent might later issue.⁶⁴ However, if the inventor has abandoned the application, or has certified that no patent applications on the same technology will be sought outside the United States, then the USPTO will not publish the pending application.⁶⁵

If the USPTO allows the patent to issue, the patent proprietor obtains the right to exclude others from making, using, selling, offering to sell or importing into the United States the patented invention.⁶⁶ The maximum term of patent protection is

⁵⁶35 U.S.C. § 111 (2000).

⁵⁷35 U.S.C. § 131 (2000).

⁵⁸35 U.S.C. § 112 (2000).

⁵⁹*Ibid.*

⁶⁰35 U.S.C. § 101. (2000).

⁶¹35 U.S.C. § 102 (2000).

⁶²35 U.S.C. § 103 (2000).

⁶³35 U.S.C. § 122(b) (2000).

⁶⁴See Joseph M. Barich, “Pre-Issuance Publication of Pending Patent Applications: Not So Secret Any More,” *Journal of Law, Technology and Policy* (Fall 2001), 415.

⁶⁵35 U.S.C. § 122(b) (2000).

⁶⁶35 U.S.C. § 271(a) (2000).

ordinarily set at 20 years from the date the application is filed.⁶⁷ The patent applicant gains no enforceable rights until such time as the application is approved for issuance as a granted patent, however. Once the patent expires, others may employ the patented invention without compensation to the patentee.

Patent rights do not enforce themselves. A patentee bears responsibility for monitoring its competitors to determine whether they are using the patented invention or not. Patent proprietors who wish to compel others to observe their intellectual property rights must usually commence litigation in the federal district courts. The U.S. Court of Appeals for the Federal Circuit (“Federal Circuit”) possesses exclusive national jurisdiction over all patent appeals from the district courts.⁶⁸ In turn, the U.S. Supreme Court possesses discretionary authority to review cases decided by the Federal Circuit.⁶⁹

Potential Conflicts Between Industry Standards and Intellectual Property

Conflicts potentially arise between industry standards and intellectual property rights.⁷⁰ When one firm has manufactured products or performed processes that comply with an industry standard, sometimes another entity has asserted that those products or processes infringe an intellectual property right. The possibility of license fees and royalties may provide a significant incentive for firms to innovate and to permit the incorporation of a proprietary technology into a standard.⁷¹ On the other hand, the intellectual property holder may possibly prevent others from using the standard altogether for a set period of time.⁷² Past disputes in this area have generally involved patent rights. A review of three well-publicized examples illustrates the potential tension between industry standards and intellectual property rights.

The VL-Bus Patent

In 1992, the Video Electronics Standards Association (VESA), a non-profit SSO, established a standard relating to the so-called VL-Bus. This standard provided mechanisms for transferring instructions between a computer’s central processing unit and its peripherals, such as a disk drive or video display. Subsequently, Dell

⁶⁷35 U.S.C. § 154(a)(2) (2000). Although patent term is based upon the filing date, the patentee gains no enforceable legal rights until the USPTO allows the application to issue as a granted patent. A number of Patent Act provisions may modify the basic 20-year term, considering examination delays at the USPTO and delays in obtaining marketing approval for the patented invention from other federal agencies.

⁶⁸28 U.S.C. § 1295(a)(1) (2000).

⁶⁹28 U.S.C. § 1254(1) (2000).

⁷⁰See Mueller, *supra* note 5.

⁷¹National Research Council, *supra* note 9.

⁷²See *supra* notes 64-69 and accompanying text.

Computer Corporation (“Dell”), a leading U.S. manufacturer of personal computers, alerted several firms that their use of the VL-Bus standard infringed a patent that Dell had obtained in 1992. The Dell announcement provoked considerable controversy because Dell itself was a member of VESA. According to some commentators, Dell had voted in favor of the VESA standard.⁷³ Further, during this process a Dell representative had allegedly certified to VESA that “to the best of his knowledge,” he knew of no patent, copyright or trademark that the VL-Bus design would violate.⁷⁴

The Federal Trade Commission (FTC) subsequently brought an administrative complaint against Dell. The FTC complaint asserted that Dell’s actions were unfair and that they unreasonably restrained competition in the computer industry. On November 5, 1995, Dell agreed to a consent decree under which it agreed not to enforce its patents relating to the VL-Bus.⁷⁵ Dell further agreed not to enforce any patent rights that were intentionally not disclosed upon the request of any standards body, and to provide information that would assist the FTC in ensuring Dell’s compliance. According to William J. Baer, Director of the FTC’s Bureau of Competition, the FTC’s action concerning the VL-Bus standard marked the first time federal law enforcement authorities took action against a company regarding intellectual property rights and industry standards.⁷⁶

The Gasoline Formulation Patent

A patent dispute between the Unocal Corporation and other firms operating in the oil industry has raised issues concerning intellectual property and industry standards.⁷⁷ In 1990, Unocal engineers developed specially formulated gasolines that result in cleaner automobile emissions. Unocal promptly filed patent applications claiming these inventions at the USPTO. Contemporaneously, representatives of Unocal, along with those of other oil companies and members of the automobile industry, met with California state air-pollution regulators. Some of Unocal’s competitors reportedly believe that during lengthy discussions with state regulators, Unocal did not disclose it had filed patent applications, while at the same time advocating adoption of clean-fuel requirements consistent with the proprietary rights it sought to obtain.

California ultimately adopted stricter emissions rules in November 1991 that became effective in 1996. As well, in February 1994, the USPTO issued the first of several patents Unocal has obtained on its gasoline technology. According to some observers, a comparison of the California regulations with the Unocal patents reveals

⁷³“Dell Tells the FTC It Won’t Press Claim For Computer Patent,” Wall Street Journal B13 (Nov. 3, 1995).

⁷⁴*Ibid.*

⁷⁵Federal Trade Commission, “Dell Computer Settles FTC Charges,” [<http://www.ftc.gov/opa/1995/9511/dell.htm>].

⁷⁶*Ibid.*

⁷⁷Alexei Barrionuevo, “Exhausting Feud: A Patent Fracas Pits Unocal Corp. Against Big U.S. Oil Producers,” *The Wall Street Journal* (Aug. 17, 2000).

it would be difficult and expensive to produce conforming fuels without infringing the Unocal patents.⁷⁸

In 1995, Unocal announced that it expected its competitors to pay royalties to produce gasoline consistent with the California standard. Several oil companies soon filed suit against Unocal in U.S. district court, asserting that one of Unocal's patents was invalid. A 1997 trial resulted in a verdict that upheld the Unocal patent and found that the patent was infringed by several of Unocal's competitors. The court also awarded Unocal damages of \$69 million, based upon infringing sales of low-emission gasoline during a five-month period in 1996.⁷⁹ The U.S. Court of Appeals for the Federal Circuit upheld this judgment on appeal.⁸⁰

Competing views exist concerning the Unocal gasoline formulation patents. The Attorney General of the State of California filed a brief with the U.S. Supreme Court, joined by 33 states and the District of Columbia, arguing that Unocal has tried to "hijack and distort" the state regulatory process.⁸¹ Some commentators have expressed concern that the Unocal patent will cause consumers to pay higher gasoline prices.⁸² Still others have associated the Unocal patent with sharp increases in gasoline prices experienced in some parts of the United States during 2000.⁸³ In contrast, Unocal's chief executive, Roger Beach, reportedly stated: "Inventions that result from independent research enhance the rule-making process."⁸⁴ Unocal management also reportedly asserts that it was not required to disclose its patent applications during the regulatory process, and that it has a right to profit from its intellectual property.⁸⁵

In the meantime, legal scrutiny of the Unocal patents continues. On March 4, 2003, the Federal Trade Commission issued an administrative complaint alleging that Unocal gained monopoly power by defrauding California authorities and industry groups during the emissions rulemaking process.⁸⁶ Initial hearings concerning this complaint are scheduled for June 2003.

⁷⁸*Ibid.*

⁷⁹34 F. Supp. 2d 1208, 1222 (C.D. Cal. 1998).

⁸⁰208 F.3d 989 (Fed. Cir. 2000).

⁸¹State of California, Department of Justice, Office of the Attorney General, "Attorney General Bill Lockyer Files "Friend of Court" Brief Over Unocal Gasoline Patent" (Sept. 14, 2000) (available at [<http://caag.state.ca.us/newsalerts/2000/00-122.htm>]).

⁸²See Alexei Barrionuevo, "FTC May Seek to Stop Unocal From Enforcing Gasoline Patents," *The Wall Street Journal* (Jan. 8, 2003), D6.

⁸³See Clifton Brown, "Unocal Scores Another Win in Gas Patent Case: Five Refiners Seek Supreme Court Ruling," *10 Corporate Legal Times* (Oct. 2000), 94.

⁸⁴Barrionuevo, *supra* note 77.

⁸⁵*Ibid.*

⁸⁶Federal Trade Commission, Complaint, In the Matter of Union Oil Company of California, Docket No. 9305 (March 4, 2003) (available at [<http://www.ftc.gov/os/2003/03/unocalcmp.htm>]).

The Electronic Commerce Patents

Controversy has also arisen over patents held by the IBM and Microsoft Corporations concerning proposed standards for negotiating electronic commerce transactions. Much of this discussion concerns the “Simple Object Access Protocol” (SOAP) and the “electronic business using eXtensible Markup Language” (ebXML). SOAP is a protocol that allows for the exchange of information in a decentralized, distributed environment.⁸⁷ ebXML provides firms with a standard method to exchange business messages, conduct trading relationships, communicate in common terms and define business processes on the Internet.⁸⁸ Some observers forecast that these two proposed standards “will one day be as important as the standard protocols (such as TCP/IP and HTTP) on which the Internet is based today.”⁸⁹

IBM, Microsoft, and possibly other firms have reportedly obtained several patents that cover SOAP and ebXML, as well as patents on complementary extensions of these standards that allow for data encryption and provide other useful features.⁹⁰ Some firms that lack these patent portfolios, as well as certain standards body representatives, are concerned that intellectual property rights holders will be in a position to charge tolls over a large amount of Internet traffic. For example, members of the World Wide Web Consortium (W3C), the standards body that is overseeing development of the SOAP specification, are said to have expressed concerns about the propriety of charging royalties for patent licenses for standardized computer technologies.⁹¹

Some commentators are critical of these electronic commerce patents. Journalist David Berlind cautions: “If the protocols do become standards, either by virtue of an independent standards organization’s imprimatur or by attaining a de facto status, IBM and Microsoft — or any other company that maintains the intellectual property rights to them — could legally impose royalties on that [Internet] traffic.”⁹² However, IBM, Microsoft and other propriety rights holders have reportedly agreed to license some applicable patents on a royalty-free basis, and to license others on reasonable and nondiscriminatory terms.⁹³ As SOAP, ebXML

⁸⁷See Simple Object Access Protocol (SOAP) 1.1 (available at [<http://www.w3.org/TR/SOAP>]).

⁸⁸See General Information About ebXML (available at [<http://www.ebXML.org>]).

⁸⁹David Berlind, “IBM, Microsoft plot Net takeover,” *Enterprise from ZDWire* (April 11, 2002).

⁹⁰Paul Krill, “W3C Close to Ratifying SOAP 1.2,” *InfoWorld Daily News* (Nov. 1, 2002); Micheal Meehan, “IBM Claim to ebXML Patent Sparks Furor: Critics See Hold on Trading Partner Portion of Spec as Big Blow to Open Standards,” *Computerworld* (April 22, 2002), 1.

⁹¹Paul Krill, “W3C Promotes Royalty-Free Web Services Standards,” *InfoWorld Daily News* (Nov. 14, 2002).

⁹²Berlind, *supra* note 89.

⁹³Matt Migliore, “IBM Patents for ebXML Raise Red Flag on Royalties for Standards,” (continued...)

and other proposed electronic commerce standards continue to evolve, more information about the role of intellectual property may become available.

The Current Legal Environment Concerning Industry Standards and Intellectual Property

As these examples demonstrate, standards and intellectual property rights may potentially conflict. Some standards bodies have attempted to preempt these disputes by establishing policies concerning intellectual property rights.⁹⁴ These policies often require members to disclose relevant patents prior to the formation of the standard, or to license these patents to other members of the standards body either on reasonable and nondiscriminatory terms, or on a royalty-free basis.⁹⁵ However, some uncertainty persists as to the extent to which these rules are enforceable, both with respect to members of that standard body, and in particular against nonmembers.

Standards Bodies Policies

The policies of standards bodies towards intellectual property vary considerably. A recent survey by Mark Lemley, a member of the law faculty of the University of California, Berkeley, revealed a number of differences among standards bodies policies.⁹⁶ Some standards bodies have no intellectual property policy at all,⁹⁷ an approach that presumably allows members a considerable degree of flexibility regarding intellectual property acquisition and enforcement. At the other extreme, some standards bodies reportedly prohibit their members from owning intellectual property relating to the standard.⁹⁸ The intellectual property policies of many other standards bodies fall somewhere between these extremes.

Many standards bodies impose some sort of disclosure obligation regarding the intellectual properties of their members. These disclosure obligations vary among standards bodies. Some standards bodies require their members to disclose issued patents.⁹⁹ Others further oblige the disclosure of patent applications that have been

⁹³(...continued)

Enterprise System Journal (July 1, 2002), at 20.

⁹⁴Jennifer L. Gray, "Internet Standards Bodies: Antitrust Guidelines," 637 Practising Law Institute Patents, Copyrights, Trademarks and Literary Property Course Handbook Series (February-March 2001), 529.

⁹⁵*Ibid.*

⁹⁶Lemley, *supra* note 1.

⁹⁷*Ibid.*

⁹⁸Professor Lemley reports that OMG, the Object Management Group, imposes this requirement. *Ibid.* See also Object Management Group, "About the Object Management Group" (available at [<http://www.omg.org/gettingstarted/gettingstartedindex.htm>]).

⁹⁹See World Wide Web Consortium, "Current Patent Practice" (January 24, 2002) (available (continued...))

filed, but have not yet issued as granted patents.¹⁰⁰ Some standards bodies further require the disclosure of published patent applications, but not those that were unpublished.¹⁰¹

Standards body policies often address circumstances where a member owns a patent relating to an adopted standard. Some standards bodies require that such patents be licensed on a royalty-free basis to other members.¹⁰² This arrangement apparently contemplates that the patent could be enforced against firms that are not members of the standards body.

Other standards bodies instead require that the patent be licensed on “reasonable and nondiscriminatory terms,” a standard commonly known as RAND licensing.¹⁰³ Some policies do not specify whether this obligation applies to members and nonmembers alike.¹⁰⁴ According to Mr. Lemley, although the RAND standard is commonly employed, it is not often further defined in terms of a specific royalty rate and other clauses.¹⁰⁵

Some standards bodies mandate that in circumstances where a patent covers a proposed standard, it is more difficult to adopt that standard. For example, at least one standards body requires a three-quarters majority to adopt a standard covered by a patent.¹⁰⁶ Other standards bodies make it easier to revoke a previously adopted standard if it is later revealed that a patent covers that standard.¹⁰⁷

In sum, the intellectual property policies of standards bodies vary considerably. One implication of this diversity of rules is that intellectual property owners may face difficulty in knowing the particular rules that will govern a particular intellectual property right. This difficulty may be especially pronounced with regard to market segments, such as the Internet, that are governed by multiple standards bodies with

⁹⁹(...continued)

at [<http://www.w3.org/TR/2002/NOTE-patent-practice-20020124#sec-Disclosure>]).

¹⁰⁰*See, e.g.*, JEDEC Solid State Technology Association, “JEDEC Patent Policy” (available at [http://www.jedec.org/Home/manuals/JEDEC_Patent_Policy_Stmt.pdf]).

¹⁰¹The ATM Forum, ATM Standards, §3.3.1 (“Intellectual Property Rights”) (available at [<http://www.atmforum.com/standards/policies.html>]).

¹⁰²RosettaNet, RosettaNet Intellectual Property Policy (June 11, 2002) (available at rosettanet.org).

¹⁰³*See, e.g.*, The Internet Engineering Task Force, “IETF Page of Intellectual Property Rights Notices” (available at [<http://www.ietf.org/IESG/Section10.txt>]).

¹⁰⁴*See, e.g.*, ECMA International, “Code of Conduct in Patent Matters” (available at [<http://www.ecma-international.org>]).

¹⁰⁵Lemley, *supra* note 1.

¹⁰⁶*See* The ATM Forum, “Patent Policy” (available at [<http://www.atmforum.com/standards/policies.html>]).

¹⁰⁷*See* European Telecommunications Standards Institute, “ETSI IPR Policy” (November 22, 2000) (available at [<http://www.etsi.org/aboutetsi/home.htm>]).

overlapping subject matter concerns.¹⁰⁸ Mr. Lemley comments that “many technology companies today face a hodgepodge of rules and obligations of which they are only dimly aware.”¹⁰⁹

The Enforceability of Standards Bodies Policies

Although many standards bodies have promulgated intellectual property policies, some uncertainty surrounds their enforceability.¹¹⁰ Suppose that a member of a standards body asserts a patent that it did not disclose during the standard-setting process, for example, or refuses to license a disclosed patent in keeping with standards body policies. As well, a firm that is not a member of the standards body may assert a patent against a competitor that sells products compliant with the standard. In such circumstances, the standards body or its members may wish to continue to employ its standard free of the intellectual property right. Past disputes of this kind have largely been based upon contract law, the doctrines of fraud and equitable estoppel, as well as the antitrust law.¹¹¹ This report reviews these doctrines in turn.

The intellectual property policy of a standards body amounts to an agreement between members to comply with certain rules regarding their intellectual properties.¹¹² The failure of one member of the standards body to comply with these rules could be considered a breach of a binding contract. The contract law would therefore appear to be a principal mechanism for enforcing one member’s promises regarding intellectual property.

Several difficulties attend the use of contract law in this context, however. First, the intellectual property policy of a standards body can only bind members of that group.¹¹³ Nonmembers are not parties to the contract and cannot be held to have agreed to it.

Second, the intellectual property policies of standards bodies sometimes employ vague language. For example, some standards bodies require only that intellectual property rights be licensed on “reasonable and nondiscriminatory terms.”¹¹⁴ Given that the term “reasonable” is susceptible to varying interpretations, it is possible that

¹⁰⁸Lemley, *supra* note 1.

¹⁰⁹*Ibid.*

¹¹⁰Cowie & Lavelle, *supra* note 34, at 98 (describing patent and competition law principles concerning standards bodies as “far from settled”).

¹¹¹*Ibid.*

¹¹²Lemley, *supra* note 1.

¹¹³III E. Alan Farnsworth, *Farnsworth on Contracts* § 10.1 (Aspen Publishers, Inc., New York, New York 1998) (observing basic principle that contracts may be enforced only by the contracting parties).

¹¹⁴*See supra* notes 103-05 and accompanying text.

a court may find this provision unenforceable.¹¹⁵ On the other hand, the court may be willing to determine whether a royalty is reasonable based upon the treatment of patents of similar scope in related industries.¹¹⁶

In addition, contracts without a specified term may ordinarily be terminated at will by any contracting party, so long as appropriate notice is given to the other party.¹¹⁷ An example of this general rule is the familiar “employee-at-will” doctrine, where employees may resign from their position, or be fired, at any time provided that reasonable notice is given.¹¹⁸ This principle leaves open the possibility that a member of a standards body may simply withdraw from the group after a standard has been formed. In such cases, that firm may no longer be subject to the group’s intellectual property policy.

Contract law does provide one approach for ameliorating this difficulty: standards bodies bylaws could provide that members must disclose or license patents that cover any standard adopted or under consideration while the member was a member of the standards body. This promise should be enforceable even after a member has resigned from the standards body.¹¹⁹ The number of standards bodies that have actually adopted this policy is uncertain, however.

The doctrine of fraud provides another mechanism for policing behavior during the standards-setting process. The legal system generally defines fraud to include the following elements: “1) a false representation (or omission in the face of a duty to disclose), 2) of a material fact, 3) made intentionally and knowingly, 4) with the intent to mislead, 5) with reasonable reliance by the misled party, and 6) resulting in damages to the misled party.”¹²⁰ If a member of a standards body knowingly failed to disclose the existence of an intellectual property right, then an accused infringer may be able to assert the existence of all six elements of fraud.¹²¹

An assertion of fraud presents some difficulties when used to enforce standards bodies rules, however. Notably, the proponent of a fraud defense may find it difficult to prove that the intellectual property owner possessed a specific intent to defraud other members of the standards body.¹²² Additionally, the doctrine of fraud is premised upon the existence of a duty of honesty between the intellectual property

¹¹⁵11 Richard A. Lord, *A Treatise on the Law of Contracts* § 30:3 (West Group, St. Paul, Minnesota 1999).

¹¹⁶Lemley, *supra* note 1.

¹¹⁷Farnsworth, *supra* note 110, at § 2.14.

¹¹⁸*See* California Labor Code § 2922 (2003).

¹¹⁹Lemley, *supra* note 1.

¹²⁰*Rambus Inc. v. Infineon Technologies AG*, (Fed. Cir. 2003).

¹²¹Cowie & Lavelle, *supra* note 34, at 129.

¹²²*Ibid.*

owner and the entity that relied upon the false representation.¹²³ As with a breach of contract argument, fraud is unlikely to be successfully employed by entities that were not members of the standards body, including other market actors and consumers.¹²⁴

An additional legal mechanism for ensuring compliance with intellectual property polices is termed “equitable estoppel.” Equitable estoppel applies when “a patentee, through misleading conduct, leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer. Conduct may include specific statements, action, inaction, or silence where there was an obligation to speak.”¹²⁵ Equitable estoppel serves as a defense to a charge of patent infringement. The accused infringer must show that it relied upon the misleading conduct and that it will be materially prejudiced if the patent is enforced.¹²⁶

Courts have applied the equitable estoppel doctrine in cases where a member of a standards body fails to disclose its intellectual property rights during the standard-setting process.¹²⁷ In one case, *Stambler v. Diebold, Inc.*,¹²⁸ an individual was estopped from enforcing his patent even though the standards body did not have an intellectual property policy at all. In that case, Stambler invented a new card validation system for use with automatic teller machines. He later sat on an ANSI standards committee that ultimately developed an industry standard that Stambler believed infringed his patent. Stambler subsequently left the committee without informing it of his patent. Later, Stambler brought suit against an automatic teller machine manufacturer that employed the industry standard. The U.S. District Court for the Eastern District of New York held that the doctrine of equitable estoppel applied, concluding:

Plaintiff had a duty to speak out and his silence was affirmatively misleading. Plaintiff could not remain silent while an entire industry implemented the proposed standard and then when the standards were adopted assert that his patent covered what manufacturers believed to be an open and available standard. Furthermore, plaintiff’s silence could reasonably be interpreted as an indication that plaintiff had abandoned its patent claims.¹²⁹

The estoppel doctrine provides one mechanism for enforcing implied or express promises to disclose intellectual property that bears upon a proposed industry

¹²³Lemley, *supra* note 1.

¹²⁴*Ibid.*

¹²⁵A.C. Auckerman Co. v. R.L. Chaides Construction Co., 960 F.2d 1020, 1028 (Fed. Cir. 1992) (en banc).

¹²⁶Schechter & Thomas, *supra* note 40.

¹²⁷Cowie & Lavelle, *supra* note 34, at 103-13.

¹²⁸11 U.S.P.Q.2d (BNA) 1709, 1714-15 (E.D. Va.), *aff’d*, 878 F.2d 1445 (Fed. Cir. 1989).

¹²⁹11 U.S.P.Q.2d at 1715.

standard.¹³⁰ In particular, the doctrine of equitable estoppel may be more readily applied than fraud because it lacks a specific intent element.¹³¹ Again, however, estoppel does not appear to operate against intellectual property owners that were not members of the standards body. Estoppel also does not appear to relate well to other obligations imposed by standards policies, such as the duty to license intellectual property on reasonable and nondiscriminatory terms.¹³²

Another cause of action that has been employed in this context is based upon the antitrust law.¹³³ Antitrust law aims to protect the integrity of market competition against attempts to raise prices or reduce output, either by a single firm that dominates the market and excludes competition, or by a group of firms that act collectively to coordinate their price and output decisions.¹³⁴ In the context of standards, an antitrust plaintiff could contend that a firm attempted to obtain market dominance by abusing the standard-setting process, perhaps by failing to disclose pertinent intellectual property or by failing to license it under the terms established by a standards body's intellectual property policy.

To date, most antitrust causes of action involving standards have involved claims of attempted monopolization.¹³⁵ To prove a claim of attempted monopolization, the proponent must show: (1) a specific intent to monopolize; (2) anticompetitive conduct in furtherance of that intent; and (3) a dangerous probability of successful monopolization.¹³⁶ As applied to standards bodies, the proponent of this claim must prove that the intellectual property owner's misrepresentations manipulated the standard-setting process in such a way that the intellectual property owner gained market power.¹³⁷

Unlike fraud and equitable estoppel, which are defenses raised against a charge of intellectual property infringement, attempted monopolization constitutes an affirmative cause of action that may be asserted by any interested party.¹³⁸ However, a claim of attempted monopolization may be difficult to prove. At least in the context of standards bodies, courts have generally imposed high standards of proof

¹³⁰David M. Schneck, "Setting the Standard: Problems Presented to Patent Holders Participating in the Creation of Industry Standards," 20 *Hastings Communications & Entertainment Law Journal* (1998), 641.

¹³¹*Ibid.*

¹³²*See supra* notes 103-05 and accompanying text.

¹³³Cowie & Lavelle, *supra* note 34.

¹³⁴CRS Report RL31026, *General Overview of United States Antitrust Law*, by (name# redacted).

¹³⁵15 U.S.C. § 2 (2000) (commonly known as "Section 2 of the Sherman Act").

¹³⁶*Spectrum Sports v. McQuillen*, 506 U.S. 447, 456 (1993).

¹³⁷Mueller, *supra* note 5.

¹³⁸Kevin J. Arquit et al., "Antitrust, Intellectual Property, Standards and Interoperability," 524 *Practising Law Institute Patents, Copyrights, Trademarks and Literary Property Handbook Series* (June 1998), 157.

on attempted monopolization claims.¹³⁹ As a result, antitrust claims will likely be limited to cases where an intellectual property owner's actions lead to significant anticompetitive consequences.¹⁴⁰

In sum, standards bodies and their members have relied upon a number of legal theories in order to enforce disclosure and licensing obligations, each with their own advantages and shortcomings. Mr. Lemley concludes that “[t]aken together, these legal rules do a fair job of ensuring that [intellectual property] owners do what they promised to do.”¹⁴¹ However, there appear to be no mechanisms in place that will enforce an industry standard against individuals and firms that were not themselves members of the group that promulgated the standard.

Legislative Issues and Approaches

Given the wide recognition that intellectual property and industry standards are of growing importance to the modern economy, the relationship between these fields is the subject of increasing attention.¹⁴² Should Congress have an interest in this area, a variety of approaches are available. If the current interface between intellectual property rights and industry standards is considered satisfactory, then no action need be taken. Indeed, growing awareness that intellectual property and industry standards can sometimes conflict may lead to more sophisticated treatment of intellectual property by standards bodies, as well as continued refinement of the governing law in the courts.

Another approach is to encourage the technology community to develop model intellectual property disclosure and licensing obligations for members of standards bodies. Standards bodies would then be in a position to follow these guidelines when developing their own intellectual property policies. This proposal might potentially lead to more uniform treatment of intellectual properties by standards bodies. Given the present diversity of intellectual property policies among standards bodies, development of “best practices” for intellectual property may be welcome. It should be noted, however, that these voluntary guidelines would not necessarily bind all patent owners. Firms might still be subject to suit by patentees that have not joined the relevant standards body, for example.

The government could also assist standards bodies in identifying intellectual properties that might bear upon a proposed industry standard. For example, the United States Patent and Trademark Office could, upon request by a standard body, conduct a search of pending patent applications and issued patents in order to determine whether these patents might bear upon a proposed standard. This capability would allow standards bodies to become more fully informed of intellectual property rights during the standard-setting process. It should be noted,

¹³⁹Lemley, *supra* note 1.

¹⁴⁰*Ibid.*

¹⁴¹*Ibid.*

¹⁴²Mueller, *supra* note 5.

however, that a number of patent research firms already exist that could conduct such a search for a fee, at least with respect to issued patents and published patent applications.¹⁴³

More extreme possible legal reforms are also possible. For example, legislation could call for public notice of approved industry standards. Proprietors would be required to identify intellectual properties that are pertinent to the standard within a set period of time. Failure to so identify applicable intellectual property to the standards body might result in some limitation upon infringement remedies against firms that practice the standard. One possibility is to grant a compulsory license in favor of use of the industry standard, perhaps limited to a set period of time so that the industry might develop a standard not subject to an intellectual property. Another is that the patentee be unable to enforce the intellectual property against individuals practicing that industry standard for a period of time, or perhaps altogether.¹⁴⁴

Any possible legal reform would be well-advised to recognize that the U.S. high technology industry is increasingly characterized both by rapid innovation and a high degree of interconnectedness. The desire to capture the benefits of research and development leads innovators to procure patents. Yet firms also desire to create compatible products and secure greater aggregate sales, resulting in the development of nonproprietary uniform standards. These two trends have sometimes led to conflicts between exclusive intellectual property rights and open industry standards.¹⁴⁵ Striking a balance between promoting innovation, on one hand, and maintaining the integrity of the standard-setting process, on the other, forms an important component of contemporary industrial policy.

¹⁴³Steve D. Beyer, "Searching — The Art Behind An Opinion," 667 *Practising Law Institute Patents, Copyrights, Trademarks and Literary Property Course Handbook Series* (Nov. 1, 2001), 45.

¹⁴⁴See Mark A. Lemley, "Standardizing Government Standard-Setting Policy for Electronic Commerce," 14 *Berkeley Technology Law Journal* (1999), 745.

¹⁴⁵Schenck, *supra* note 3.

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