Who Owns the Charles River Bridge?
Intellectual Property and Competition in the Software Industry

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1. Introduction

Long, long ago, in an economy far away, decisionmakers responsible for maintaining the footings of commerce faced a troubling question: should entrenched property rights, manifested in a publicly chartered bridge franchise, be permitted to stand in the way of a new bridge, to compete directly with the established one? The question as posed pitted two important public policies – the sanctity of public charters and the imperative of technological progress – against each other in stark, unavoidable fashion. The case was resolved, ultimately, by the Supreme Court. In a narrow legal sense, the case rejected the notion that a state-chartered corporation received a perpetual exclusive franchise to operate bridges over the Charles in Boston. But in a wider sense, the case issued a clear, sweeping verdict: competition wins out, over established franchises, over old money, over political influence. The *Charles River Bridge* case,[1] as it was known, reverberated through the Jacksonian era, and still carries weight to this day.

[1] Proprietors of Charles River Bridge v. Proprietors of Warren Bridge, 36 U.S. (11 Pet.) 420 (1837).

The momentous issues gnawing away at the software industry today carry some of the earmarks of this early conflict. Once again, decisionmakers are faced with a stark choice, a clash of policies. On one side stands property rights – in the form of copyrights, and increasingly patents and trademarks – and the policy they embody: incentives for creative initiative. On the other stands the policy of open, robust competition, manifested both in antitrust law and in limitations embedded in the property rules themselves. Today, as before, the legal system is asked to determine the competitive reach of entitlements, and so thereby to set the boundaries of competition. Although the property rights are more variegated and complicated (as befits the more complex assets they cover), and often, held by more than one firm, in certain key respects they stand in the way of new entry, of new technologies – in short, of competition. Powerful economic imperatives govern the cornerstone pieces of the technological networks at the heart of the digital economy. Ownership and control of these core assets is thus a crucial issue of economic policy – as important in the next century as ownership of cornerstone tangible assets, such as bridges, was in the last.

Apart from the clash of concepts, of course, everything else has changed since the early nineteenth century. The intellectual property rights protecting various technological systems at the heart of the modern, digitized economy are different in kind as well as degree from the bridge company's state charter. (For one, intellectual property protects inventive or expressive contributions, which are not usually coextensive with economic markets.) The economy itself has mutated so much, and now changes so fast, that it is difficult to see parallels with bygone days. And those who bear authority in the legal system, particularly within antitrust, are loath to disturb the patterns of competition that generate these lightening-fast changes, and the growth that seems inevitably to come in their wake.

But despite the differences, the conflict is the same. And it will have to be resolved. Perhaps we will be deprived of a single focal event such as the *Charles River Bridge* case (although U.S. v. Microsoft is certainly a candidate). Resolution may take a

much more piecemeal form. But in any event, the legal system will have to resolve the conflict. Which leads to the intriguing question: How, given new industries and technologies, and different legal entitlements, will the drama play out? What tools are available for resolving the competing claims of property rights versus open competition, and how are they likely to be deployed? These are the issues, stated most abstractly, that this paper takes up.

Momentous clashes of this sort rarely announce themselves. The issues discussed here will play out under the surface of individual cases, at the concrete level of legal doctrine. In particular, the following principles and doctrines, reviewed in order in sections 2 and 3 below, are likely to play an important part in the debate:

1. In **copyright law**, the emergence of a general principle of "interoperability," an outgrowth of –

    (a) Two nascent concepts, which I deem "disproportionate leverage," and "user holdup," both of which emerge from caselaw dealing with the following doctrines:

        (i) fair use, (ii) non-protection of systems and methods, and (iii) copyright misuse;

2. Arguments to extend the interoperability principle to **patent law**, primarily through the doctrine of patent misuse; and

3. **Antitrust law**, especially as applied to oversight of standard-setting bodies.

Because copyright is a limited grant to begin with, points 2 and 3 are likely to represent the most concentrated frontal assault on property in the name of competition in this area, and the closest the contemporary literature has come to making the connection between today's digital standards and the issues at stake in the Charles River Bridge case.

Accordingly, I devote a good deal of attention to the argument in section 3, even adding there my own proposal along these lines, a new doctrine with the fanciful name of "technological genericide." Lest one get carried away, my Conclusion reprises the conservative dissent by Justice William Story in the Charles River Bridge case. It is meant to suggest the dangers of applying too readily this or any other doctrine that limits property rights.

2. Copyright and Interoperability

Though rooted in a myriad of doctrinal formulations, two basic themes have emerged in the law of software copyright: call them "disproportionate leverage" and "user holdup." Together, they support the newly emergent principle of "interoperability."[2]

By "disproportionate leverage" I mean that courts have groped for language that describes their sense that "small" property rights are being employed to leverage very large markets. Copyright in particular, a limited form of protection for expression alone, has been singled out as an inappropriate vehicle for protecting broad markets defined in part by technological standards.

This comes across clearly in the "game cartridge" cases.[3] These centered on claims that copyrights in very short sequences of computer code effectively permitted

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[2] On the meaning and doctrinal origins of this term in copyright, see generally David R. Owen, Note, *Interfaces and Interoperability In Lotus v. Borland: A Market-Oriented Approach To The Fair Use Doctrine,* 64 Fordham L. Rev. 2381 (1996).

[3] *See, e.g.*, Sega Enters. Ltd. v. Accolade, Inc., 977 F.2d 1510, 1523-24 (9th Cir.1993); Practice Management Info. Corp. v. Am. Med. Ass'n, 121 F.3d 516, 520 (9th Cir. 1997), modified XX (characterizing game cases):

> This court has not allowed the owners of copyrights in expressions mandated by industry standards to use their copyrights to stifle independent creative expression in the industry. *Sega*, 977 F.2d at 1523-24.

game cartridge sellers to prevent the sale of competing cartridges by "unauthorized" competitors. Tiny lock-out codes were the key to the entire market, in other words. Again and again the courts in these cases rebelled against the idea that a thin property right (copyright) in a short sequence of code could be used to prevent competition in a large market – the market for console-compatible game cartridges. Copying short program sequences has been held protected by the fair use defense in these cases.

These cases fit neatly into the general principle of interoperability. The same principle was at work in the First Circuit opinion in *Lotus v. Borland*.[4] Here the issue was copyrightability – in particular, whether Lotus could assert enforceable copyrights over the menu command structure for its popular 1-2-3 spreadsheet application program. The court decided it could not, and was affirmed by an equally divided Supreme Court. The court emphasized users' significant expenditure of time and money, and spoke of not permitting Lotus to hold these investments "captive." The opinion thus serves as a prime example of the second strand of the interoperability principle, "user holdup."

The growing caselaw on copyright misuse is mostly about interoperability. Under this heading, courts have refused to enforce agreements (and copyrights underlying them) when licensors are seen as impermissibly leveraging copyrights. Consider a recent example, *Alcatel USA, Inc. v. DGI Technology., Inc*.[5] This is one of a series of cases considering whether copyright in a digital phone switch operating system could be asserted in a way to prevent competitors from designing and introducing competing switches. Following other recent cases,[6] the *Alcatel* court said no, and in the process articulated nicely the concept of disproportionate leverage:

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[4] 49 F.3d 807 (1st Cir. 1995), aff'd per curiam by an equally divided Court, 116 S. Ct. 804 (1996).

[5] 166 F.3d 772 (5th Cir. 1999).

[6] *See, e.g.*, DSC Communications Corp. v. DGI Technologies, Inc., 81 F.3d 597, 38 U.S.P.Q.2d 1699 (5th Cir. 1996), aff'g DSC Communications Corp. v. DGI Technologies, Inc., 898 F.Supp. 1183 (N.D.Tex. 1995).

> Any competing microprocessor card developed for use on DSC phone switches must be compatible with DSC's copyrighted operating system software. In order to ensure that its card is compatible, a competitor such as DGI must test the card on a DSC phone switch. Such a test necessarily involves making a copy of DSC's copyrighted operating system, which copy is downloaded into the card's memory when the card is booted up. If DSC is allowed to prevent such copying, then it can prevent anyone from developing a competing microprocessor card, even though it has not patented the card.
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> Under these facts, DSC's assertion that its licensing agreement does not prohibit the independent development of compatible software is simply irrelevant. Despite the presence of some evidence -- the testimony of a DSC executive -- that DGI could have developed its own software, there was also evidence that it was not technically feasible to use a non-DSC operating system because the switch has a "common control" scheme in which each microprocessor card in a network of such cards runs the same operating system. Hence, without the freedom to test its cards in conjunction with DSC's software, DGI was effectively prevented from developing its product, thereby securing for DSC a limited monopoly over its uncopyrighted microprocessor cards . . . .

The cases dealing with telecommunications are based doctrinally in the law of copyright misuse. The crux of the cases lies in agreements between operating system suppliers and their licensees. Nevertheless, the similarity to the game cartridge cases is evident. In both sets of cases, courts frame the issue as whether copyright in one "software" component of a standardized product could be used to control the market for the entire system – i.e., for a hardware/software combination that constitutes the total product. In each case courts have answered no. A consistent rationale can be teased out of the disparate opinions: a "little copyright" may not be used to control a "big market." In a nutshell, this is what I mean by the principle of "disproportionate leverage." It may

be considered a consistent application of the basic premise, articulated in the foundational copyright misuse case of *Lasercomb v. Reynolds*,[7] which concluded that licensing agreements would not be enforced "in a manner violative of the public policy embodied in the grant of a copyright."[8] As indicated earlier, the "public policy" behind the principle of disproportionate leverage is the encouragement of interoperability in standards-driven markets.

The nascent principle of disproportionate leverage finds voice in other cases as well. The Ninth Circuit Court of Appeals found copyright misuse recently in an exclusive agreement between the American Medical Association and the federal government's Health Care Financing Agency.[9] The agreement adopted the AMA's procedure code book as the standard coding system for medical billing and accounting. Although rejecting the sweeping conclusion that copyrights in codes that have become standards are *per se* unenforceable, the court did rely on the "substantial and unfair advantage" the exclusivity agreement conferred on the AMA's codes.[10]

At the same time, it is far too early to tell whether the nascent pro-interoperability trend will endure, and if so, what its final contours will be. Stated in terms of this principle, the issue in several recent cases dealing with after-market service arrangements

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[7] 911 F.2d 970 (4th Cir. 1990).

[8] Lasercomb, 911 F.2d at 977.

[9] Practice Management Info. Corp. v. Am. Med. Ass'n, 121 F.3d 516 (9th Cir. 1997), modified .

[10] AMA, 121 F.3d at 521:

> The adverse effects of the licensing agreement are apparent. The terms under which the AMA agreed to license use of the [code book] to HCFA gave the AMA a substantial and unfair advantage over its competitors.

The court did not expand on its holding, which leaves in doubt the circumstances under which a "tie-out" agreement involving a copyrighted work is enforceable in the Ninth Circuit.

is whether intellectual property rights in diagnostic software and repair parts can be used to control an entire service market.[11] In other words, these cases must decide whether ownership of property rights in service components confers excessive leverage in the service market for devices as a whole. While the results are somewhat mixed to date, a consensus result seems quite possible. Courts might well determine that the software and parts used in repair are substantial enough, and the service markets are not very large, so that ownership of components does not result in "disproportionate leverage."[12]

Such a consensus in service cases would only reinforce the uniqueness of standards-dominated markets, however. The benefits of technological standards in some markets are by now well understood. Disproportionate leverage cases speak to the impropriety of controlling a standard – and the market(s) it defines – by virtue of one strategically important property right. The concept of user holdup is similar, and indeed might be seen as a special case of disproportionate leverage. The basic idea is that the success of some standards is attributable more to the *collective labor* of the users than to the labor or intrinsic merits of the work's creator. Judge Boudin, for example, concurring in the First Circuit's decision in *Lotus v. Borland*, said that Borland's 1-2-3-compatible product was

[11] Image Technical Services, Inc. v. Eastman Kodak Co., 125 F.3d 1195 (9th Cir. 1997) cert. denied, 118 S.Ct.. 1560 (1998), on remand from Eastman Kodak Co. v. Image Technical Services, Inc., 504 U.S. 451 (1992) (affirming jury verdict of patent misuse in refusal to license copier parts patents, and stating that district court's failure to instruct jury that a patent holder's refusal to deal is presumptively valid was "harmless error"). One court has explicitly refused to follow this case. *See* In re Independent Service Organizations Antitrust Litigation, 989 F.Supp. 1131, 1140 (D. Kan. 1997) ("Intent to monopolize certainly is an essential element of a Section 2 claim, however, proof of intent to monopolize cannot transform a patent holder's unilateral refusal to deal [, explicitly authorized by the Patent Act, 35 U.S.C. § 271(d)] into unlawful exclusionary conduct.").

[12] *See, e.g.*, Data General, Inc. v. Grumman Systems Support Corp., 36 F.3d 1147 (1st Cir. 1994) (refusing to find antitrust violation in refusal to license copyrighted diagnostic software to third party competitors in service portion of industry).

> merely trying to give former Lotus users an option to exploit their own prior investment in learning . . . . [I]t is hard to see why customers who have learned the Lotus menu and devised macros for it should remain captives of Lotus because of an investment in learning made by the users and not by Lotus.

Here we find Judge Boudin arguing that the efforts of the users in learning a new work, such as the computer protocol in the example above, rather than the efforts of the creator in designing the work, account for the success of these kinds of works. It follows from this that the claims of the work's creator must give way to those of the users in some cases.

2.1 Technological Standards and Human Capital Investments

This logic is developed in the following passage, drawn from an article applying to intellectual property law the labor-oriented property rights theory of philosopher John Locke:[13]

> Giving ownership in intellectual products that have come to serve as standards . . . would not ordinarily leave "enough, and as good" [in the Lockean sense]. There may be room in the world for only one of a given type of thing, or a long-lived artifice may become a mode of communication. It is the nature of a standard that nothing "as good" is available. For these reasons, the [Lockean] proviso would be violated if the courts gave those who create standards in nonfungible goods a right to prevent people from utilizing them.

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[13] Wendy J. Gordon, A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property, 102 **Yale L.J.** 1533, 1600 (1993) (footnote omitted). *See also* Justin Hughes, The Philosophy of Intellectual Property, 77 **Geo. L.J.** 287, 315-23 (1988) (suggesting that ownership of most intellectual products will easily satisfy the Lockean proviso though "extraordinary ideas" like generic trademarks, id. at 321-22, should remain open for all to use.)

The recognition that labor ought to be compensated is an old notion in intellectual property law. Much caselaw makes sense only as a manifestation of the impulse to reward labor. Recently, "sweat of the brow" theory, thought to have been defeated in the area of databases by the Supreme Court, has been resuscitated by Congress via proposals for special database protection.[14] And so with other areas as well, in particular the amorphous but important doctrine of "misappropriation."[15] Typically, the labor that intellectual property recognizes is the labor of a work's *creator*: the author of the protected work. With a few exceptions – e.g., the early videogame cases, where courts struggled with the concept that a video game player in some sense "coauthors" the game's individualized audiovisual experience – the law of intellectual property has no trouble identifying the "author" whose extensive labor must be protected.

But notice the countertrend in the area of standards. In the copyright interoperability cases, in particular Judge Boudin's opinion in *Lotus v. Borland*, as well as the commentary excerpted earlier, there is another player whose labor now begins to count in the analysis: the user. Consumers of copyrighted works are now understood to make significant investments in learning them, and in building up libraries of material that are compatible only with the protected work. The heavy emphasis on the spreadsheet "macros" users create in the Lotus 1-2-3 format bears this out. It is the user's efforts, the user's investments of time, that are here the subject of the legal inquiry. The labor theory has thus come full circle: instead of creators being protected against rapacious users (i.e., competitors), users must be protected against rapacious creators.

The user-labor concept is poorly articulated, partly because it is so new. But one primary thread can be identified across the disparate cases: an inchoate sense of the potential for user "holdups" at the hands of the owners of standards. This "user holdup"

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[14] *See, e.g.*, **Robert P. Merges, et al., Intellectual Property in the New Technological Age (Aspen Law & Bus., 1997)**, at Chapter 4, pp. 332-334 (copyright).

[15] Leo J. Raskind, *The Misappropriation Doctrine as a Competitive Norm of Intellectual Property Law*, **75 Minn. L.Rev. 875 (1991)**.

thread is barely discernible, but potentially quite powerful (not to mention interesting).[16] So it is very much worthwhile to tease it out of the cases and describe where it might be headed.

2.2 Preventing "User Holdup": Counterleverage for Users

The following is one account of what is animating the cases on interoperability. It is not in any sense a description of what courts *say* (let alone *think*) they are doing in this area. But it does tie together some disparate cases, and identify what might be called, for lack of a better term, the "spirit" of the cases.

Essentially, courts are worried that users who have made standard-specific investments may be subject to holdup on the part of the standard's owner. This is clear as a bell in the *Lotus* case; recall Judge Boudin's statement that it is hard to see why users "should remain captives of Lotus because of an investment in learning made by the users and not by Lotus." Here we see the basic outlines of a typical holdup problem: (1) the emphasis on users' asset-specific investments, made over time; and (2) the threat that this will make the users "captives" of the asset's owner.

Viewed this way, the specific doctrine contested in *Lotus* was less important than the holdup dynamic. The First Circuit's solution, at least as envisioned by Judge Boudin,

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[16] On a positive note, it is interesting because it reveals an explicit concern with the distributional side of rights allocations. As a normative matter, it raises in a concrete way an interesting question often discussed in property rights theory generally: whether and to what extent distributional concerns such as Lockean labor theory provide foundations for property rights systems – i.e., provide a theory of appropriate initial property endowments – as well as a rationale for particular policies, such as limits on entitlements or their uses. *See* Ian Ayres, *Discrediting the Free Market (Book Review)*, **66 U. Chi. L.Rev. 273 (1999)** (reviewing book discussing property rights, redistribution, and the appropriability of the market vs. government intervention dichotomy); Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, **102 Yale L.J. 1533, 1560-72 (1993)** (Lockean account of intellectual property rights).

was also more significant for its underlying economic logic. By denying that Lotus' menu structure was protectable under copyright law, the court in effect reduced the effectiveness of a holdup strategy. With the menu structure in the public domain, macros are reusable on competitors' systems. This dramatically increased the "salvage value," or next-best use of the macros outside the user's contractual relationship with Lotus. This obviously damages Lotus' prospects for locking users into a 1-2-3 standard.

We can employ the standard economic language describing this interaction to restate the point of *Lotus* and similar cases: they aim to prevent holdup, by making users' investments less asset-specific, thereby curtailing the occasions for opportunism on the part of the seller of the copyrighted work.[17] Or, in the alternative: copyright law's prohibition on copyrighting assets of this sort serves as a hostage posted by the seller; in the presence of opportunism or shirking on the original contract, the threat to the hostage can be executed: users can take their macros elsewhere, to employ in another seller's product.[18]

2.3 Problems with the Holdup Analogy

The holdup analogy relies on a parallelism between the lock-in that comes after a contract is signed (Williamson's "great transformation") and the lock-in that occurs naturally in a market characterized by network externalities. This is of course a hotly contested point. Because users are not contractually committed to a standard, they have the formal, *de jure* right to switch to another product. But because of the powerful

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[17] The obvious references here are to Oliver Williamson, Markets and Hierarchies (1975), and The Economic Institutions of Capitalism (1985).

[18] Of course, if users have so much freedom of action that they can appropriate the value of the seller's product without compensating for the risk-adjusted costs of creating the product, underproduction will result. *Cf*. Robert P. Merges, Intellectual Property Rights, Input Markets, and the Value of Intangible Assets (Working Paper, Feb., 1999) (strong

dynamic of standards-driven markets, users are for all practical purposes committed to a standard over the long haul. This is why low-cost, or even free, early versions of a product can lead to the potential for anticompetitive monopolization – and the attendant supra-competitive pricing – in later periods. Where this threat is present, there is no need for contractual lock-in; the standard itself supplies a kind of self-enforcing quasi-contractual commitment, at least in the short term. If, according to the conventional account, a superior product can overcome the high switching costs at some point, the self-enforcing mechanism will expire. In the meantime, the user is locked in. Where substantial user investments are expected during the lock-in period, the threat of holdup, or something like it, looks very real indeed.

Aside from objections to the basic parallelism, there are other potential problems with the holdup analogy. First, if users have roughly the same information as the seller of a standard product, they will foresee the threat of holdup and take steps to protect themselves. This could take the drastic form of eschewing reliance on the product altogether, i.e., refusal to purchase. And if this response was either foreseeable or readily recognized by the seller, it could take steps to allay the fears of potential users. Surely this very dynamic underlies at least some of the movement toward "open standards" in various contemporary industries. The logic at work here is the same as with the traditional practice of "second sourcing" in the semiconductor industry. The question naturally arises: if a standard product poses a real risk of holdup, won't we see an "open source" strategy by sellers to allay this fear; and, conversely, where we do *not* see an open source strategy, doesn't this imply little risk of holdup, or at least viable alternative solutions to the threat of holdup?

Three potential answers suggest themselves. First, there may be enough uncertainty about the law that users expect – implicitly, at any rate – that they will be protected against the worst forms of holdup when suppliers forego open sourcing and keep a standard proprietary. If so, users who make investments based on this assumption

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property rights can serve as transactional safeguards, and thus facilitate production of R&D-intensive inputs by specialized, independent firms).

may be said to have a "reliance interest" (in the legal sense) in the law's anti-holdup protections. Second, there is often a great deal of uncertainty over how widespread and durable a standard may become. Users may therefore make a perfectly rational adoption decision which, because of unforeseeable contingencies, later proves to have serious social welfare costs. It is not unheard of for the law to relieve such parties of their legal obligations; an analogy would be to the rule of "impossibility of performance" or "frustration of purpose" in contract law, which relieves a promising party of his or her obligation to perform when an unforeseen event makes performance pointless (e.g., paying rent for a building that has burned down).

Finally, the law may concern itself in these instances as much with distributional concerns as with questions of allocational efficiency. Put another way, assume a standard owner executes a latent holdup threat, and that this is foreseeable to users. We can assume in this instance that users are better off even after being held up (e.g., by monopoly pricing in a later period) than they would have been if they had never purchased the standardized technology in the first place. If the law nonetheless calls for intervention under these circumstances, it must be based on the notion that it is unfair for the supplier to reap where it has not sown. The idea – again, commonplace in various corners of intellectual property such as the "misappropriation" doctrine – is that the law serves to enforce norms of fairness, in addition to its role as purveyor of efficiency-enhancing rules of behavior. While normally applied in favor of the creator of certain kinds of works not otherwise protectable by intellectual property law, there is no reason in principle why the same impulse cannot be made to serve the benefit of users. The thought might be that, beyond a certain level of reward, giving rights to the creator of a work no longer advances incentives to an appreciable degree. At this point, especially where users have invested significant time and energy in the cultivation of standard-specific works of their own, the law might well favor the user.

The objections to a distributional role for legal rules are well-known; indeed, they served as one of the early rallying points for the law and economics movement.[19] In the particular case of intellectual property, one objection that suggests itself immediately can be stated in terms of tournament theory. While a wildly successful work may appear to provide rewards far in excess of what it in some sense "deserves," the very existence of inordinately large rewards may serve as a powerful incentive for many other would-be creators and innovators. My point here is therefore not that distributional issues can necessarily be introduced in a simple, clearcut way. It is only that as a *positive* statement, there are distributional currents in the law of intellectual property that may well manifest themselves eventually in the emerging law of standards and interoperability.

Having developed the notion of user holdup, and of interoperability in general, we must now consider whether it might be applied to standards covered by patents.

3. Patent Law and Interoperability

To date, copyright has been at the center of the caselaw on interoperability. Increasingly, however, firms are obtaining patents on various components of software programs. The tortured progress of the idea of software patents need not be reviewed here. Today, software inventions are patentable, period. The surest sign of this is that we are beginning to see patent cases involving software that do not even mention the question of patentable subject matter.[20] Indeed, we have moved on to new frontiers: the issue of the day in this respect is now whether "business concepts" (such as

[19] See summary, Richard Posner, Economic Analysis of Law 286-87 (5th ed. 1997) (efficiency the sole concern of common law rules).

[20] *See, e.g.*, Enpat, Inc. v. Microsoft, Inc., 26 F.Supp.2d 806 (E.D. Va. 1998).

Priceline.com) can be patented – and again, the answer (largely by default) appears to be "yes."[21]

And so the question arises: as legal protection for software expands from copyright to patent, will patent law adopt or evolve pro-interoperability rules, as copyright has? In preceding sections, I reviewed certain doctrines in copyright law that can be read as in some general sense favoring the diffusion of "standards," conceived broadly. It must be pointed out, however, that an important principle animating these doctrines is that neither copyright nor trademark law should be permitted to usurp the domain of patents. In copyright, this principle is codified in the statute. It is no less important in trademark law, where it is recognized directly in the caselaw (e.g., in the rule that "functional" aspects of products may not receive trademark protection) and indirectly in the statute (e.g., by way of a functionality objection to an attempt to register a trademark).

The prohibition on "backdoor patents" marks patents out as a special domain in intellectual property law. This raises an obvious question: are the various doctrines that constitute the pro-interoperability trend limited to copyright and trademark? In other words, are they aspects of the general policy against extending non-patent intellectual property rights into the domain of functional technology, which is reserved exclusively for patent law? If so, then these rules might well fit less well into the fabric of patent law.

This is certainly one plausible reading of the cases. But another reading, looking beyond the surface of the doctrine, is also possible. There are some plausible reasons to believe that at least some degree of interoperability might make sense as a general policy throughout intellectual property law. On this reading, statements distinguishing patent law in cases limiting copyrights are pure *dictum*, trotted out only to make interoperability

[21] *See* Robert P. Merges, As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts (Paper presented at the U.C. Berkeley Conference on Electronic Commerce, March 3, 1999), forthcoming **Berkeley Tech. L.J. (1999)**.

seem a less drastic result. They distinguish patent law from their holdings, without in any way actually limiting the applicable rules in patent cases.

This is a plausible reading of non-patent cases, for the time being at least, for the simple reason that it has not yet come up. It is interesting to ask why not. Even though software patents are new, many important hardware markets are characterized by the same dynamic of network externalities and thus strategically important standards. All sorts of products, particularly consumer electronics, involve standards: everything from CD players to modems to cell phones. Why haven't any of these technologies yet produces a challenge to patentees, putting squarely before us the issue of whether a policy favoring interoperability makes sense even in the face of patents?

The primary reason is that patents, unlike copyrights, often cover only a single component or feature of an overall product. In other words, there is a less than perfect mapping from a patent onto a product space; a single patent is rarely coextensive with an economic market. Although the simple presence of a patent is sometimes said to confer monopoly power, it is now usually understood that this is not necessarily so. Moreover, in the case of the important consumer electronics products just listed, multiple, rivalrous firms own patents covering various components of the overall product.[22] From a business perspective, this means firms must often work together to set a standard. They must deal with each other to be able to sell a viable product.[23] Consequently, at the level of legal doctrine, there has been little or no pressure to develop an "interoperability" principle. It has emerged voluntarily, in the form of

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[22] *See* Carl Shapiro, *Exclusivity in Network Industries*, forthcoming, **7 Geo. Mason L.Rev. (1999)**, draft at 7 (making this point, but also noting that copyright and patent can play an important role in creating "pockets of market power" in network industries).

[23] For an account of the benefits of disintegrated "platform" ownership, especially in terms of increased competition, see Timothy F. Bresnahan and Shane Greenstein, *Technological Competition and the Structure of the Computer Industry*, **47 J. Ind. Econ. 1-40 (1999)**.

bargaining among members of various standards-setting organizations and/or patent pools.[24] This is not to say that a single entity will never have patent rights that cover a product with standards characteristics; indeed, the prospect of such a situation is discussed in a later section. I merely point out that the nature of technology-intensive R&D seems to lead most often to interleaving component-based innovation. Indeed, the very richness of the institutional and legal frameworks for patent bargaining illustrate how common it is that multiple firms must get together to integrate various state-of-the-art components to constitute a standard.

3.1 Interoperability by Agreement: Standard-Setting Organizations

Before returning to the question of whether and to what extent patent law should develop rules promoting interoperability, we should first consider a form of *indirect* regulation in this general area. This is the emerging antitrust law regulating the conduct of standard-setting bodies. In one well-known recent cases, Dell Computer Corporation agreed not to assert a patent on its "VL-Bus" technology, because the patent was not disclosed during standard-setting procedures run by the Video Electronics Standards Association (VESA).[25]

The appropriate antitrust approach to indirectly regulating these arrangements was well stated by legal scholar Mark Lemley. In an article on antitrust implications of

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[24] *See generally* Robert P. Merges, Institutions for Intellectual Property Transactions: The Case of Patent Pools (May, 1998), forthcoming in **Intellectual Products: Novel Claims to Protection and Their Boundaries (Oxford Univ. Press, 1999) (Rochelle Dreyfuss, ed.)**.

[25] *See* U.S. Federal Trade Commission, "Dell Computer Settles Charges," Press Release, Nov. 2, 1995, avail. Westlaw, 1995 WL 641656 (F.T.C.). For a lengthy overview, see Sean P. Gates, *Standards, Innovation, and Antitrust: Integrating Innovation Concerns into the Analysis of Collaborative Standard-Setting*, **47 Emory L.J. 583 (1998)**.

standards-intensive industries, Lemley explained why markets with network-standards characteristics pose a challenge to conventional antitrust law:[26]

> It's a very strange time to be an antitrust lawyer, particularly in the information industry. Companies and antitrust regulators regularly do things that seem utterly incomprehensible to anyone schooled in classical antitrust doctrine. . . . Antitrust plaintiffs complain that their competitors won't share enough product data with them, and the Federal Trade Commission orders information sharing among competitors as a remedy for potential antitrust problems . . . .

Lemley argues that the standardized markets calls for special scrutiny of strategic, anticompetitive efforts to influence the adoption and diffusion of particular standards:

> Specifically, I propose that antitrust scrutiny of standardized markets . . . be limited to efforts to police standards competitions to prevent market-tipping conduct. I also argue that . . . the Sherman Act should treat joint standard-setting organizations as generally procompetitive forces in standardized markets, and that antitrust scrutiny of such groups should focus on potential anticompetitive behavior by firms within such a group.

Lemley, drawing on the economics literature, emphasizes strategic "market tipping" behavior as an important policy issue in any standards competition.[27]

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[26] *Antitrust and the Internet Standardization Problem,* **28 Conn. L. Rev. 1041, 1042-1043 (1996).** For related work, see Mark Lemley, *Legal Implications of Network Economic Effects*, 86 **California Law Review** 479 (1998); Mark Lemley & David McGowan, *Should Antitrust Trump Intellectual Property in Network Markets?* (1999) (discussing intellectual property issues in more detail).

[27] *See, e.g.*, Joseph Farrell & Garth Saloner, *Competition, Compatibility and Standards: The Economics of Horses, Penguins, and Lemmings*, in Product Standardization and Competitive Strategy 1 (H. Landis Gabel ed., 1987).

> [One] palatable . . . approach to achieving interoperable standards is the adoption of a single standard by a private industry organization. If the members of such a private standard-setting group collectively have a significant market share, their adoption of a standard may produce the "tipping" effect described above, bringing the rest of the industry into line. Private standard-setting organizations are more efficient than government organizations in several respects. Because they are more market-oriented, they are less likely than their government counterparts to settle on an inefficient standard. If they do choose an inefficient standard, it may be less entrenched than an equivalent government standard, since private standards are potentially subject to "leapfrogging." Significantly, private group standard-setting may also be more efficient than de facto standardization, since having multiple companies participating in a standard means that those companies can compete to offer products incorporating the standard after it is selected, thus expanding output and lowering prices.

3.1.1 Standards and Patent Pools

Recent antitrust enforcement policy has begun to reflect the argument that patent pooling can confer net social gains. I have explored elsewhere how those gains come about, out of a background of strong property rights and high transaction costs.[28] I have also tried to show that patent pools are in no sense unique -- that, to the contrary, they are illustrative of a whole family of transactional institutions based around intellectual property rights.

A recent example of a patent pool in the service of a standard involves the MPEG-2, a data compression technology. A pooling arrangement for patents involving this technology was recently finalized and approved in a Business Review Letter by the

[28] Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations,* **84 Calif. L. Rev. 1293 (1995).**

Antitrust Division of the Department of Justice.[29] Because the MPEG-2 Pool usefully illustrates how pooling advances standards (and hence "interoperability"), it is described in some detail in this section.

The MPEG-2 pool is an agreement among nine patent holders[30] to combine 27 patents that are needed to meet an international standard known as MPEG-2 video compression technology. The MPEG 2 standard was agreed in 1995 by the Moving Picture Experts Group of the International Standards Organisation (ISO) and the International Electrotechnical Commission.[31] Under the agreement, the patent holders all license their MPEG-2 patents to a central administrative entity known as MPEG LA, based in Denver. MPEG LA is essentially a licensing agent; it administers the pool on behalf of the members. MPEG LA licenses the 27- patent portfolio to third parties who will manufacture products to meet the MPEG-2 standard.

The MPEG-2 pool has the following features common in other pools I have studied:

- "One-stop shopping" for patent/technology inputs into manufaturing processes;[32]

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[29] *Patents For MPEG-2 Technology Response Letter, June 26, 1997*, available 1Westlaw database, document no. 1997 WL 356954 (D.O.J.).

[30] Current essential patent holders who are members of MPEG 2 (either by themselves or through related entities) are Columbia University, Fujitsu, General Instrument, Matsushita, Mitsubishi, Lucent, Philips, Scientific-Atlanta and Sony.

[31] On the economic importance of standard-setting committees, see Joseph Farrell & Garth Saloner, *Coordination Through Committees and Markets*, **19 Rand J. Econ., 235 (1988)**.

[32] By the beginning of 1998, Columbia University, ComStream, DX Antenna, Divicom, Dooin Electronics, Fujitsu, Gunzameory Computer, Kenwood, Matsushita/Panasonic, Mitsubishi, NDS, NTT, NextLevel, Nippon Steel, Philips, Pioneer, Samsung, Sampo, Sanyo, Scientific-Atlanta, Sharp, Sony (several divisions), Tadiran, Toshiba and JVC/Victor were all licensees. *See* The "Amended and Restated Limited Liability Company Agreement of MPEG LA," cited extensively in the Review Letter, *supra*.

- An institutional structure reflecting weighted representation among patentees;
- Expert administrative valuation procedures for (1) determining royalty splits among members and (2) "blanket" licensing charges to licensees;
- A negotiation framework for determining whether new technologies merit addition to the pool; and
- A pre-agreed procedure for settling disputes.

MPEG-2 is an institution, as opposed to a simple one-time transfer of rights. It has a governance structure and a set of internal rules (codified in a formal "charter"[33]). Most importantly, there is a permanent administrative procedure for evaluating new technologies. The pool is charged with determining whether new patented technologies are

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Manufacturer royalty rates are as follows:

- Consumer products (TV set top boxes, computers and the like) which incorporate an MPEG-2 encoder or decoder pay a royalty rate of $4.00 per product (Art. 2.2, 2.3, 3.1.1, 3.1.2). Consumer products which incorporate both an encoder and decoder such as a camcorder are licensed for a total royalty of $6.00 (Art. 3.1.4).
- Packaged media such as DVD or other optical disks or magnetic tapes: for consumer use ($.04 per disk or medium per "MPEG-2 Video Event," e.g., fength feature film) or commercial use ($.40 per disk or medium per "MPEG-2 Video Event.
- "Distribution Encoding Products" -- generally those used in real time broadcasts and cable transmissions -- are $4.00 per device per channel which is incorporated in the device. (Art. 2.5, 3.1.3). Royalty rates for "Transport or Program Stream Products" such as multiplexers are $4.00 times the greater number of inputs or outputs.

Thus, for example, the royalty due from a film studio on a DVD disc sold to consumers incorporating a single "MPEG-2 Video Event" would be $.04, or .16% of the retail price, assuming a price of $25.00. If the disc incorporates a patent of each essential patent holder where the disc is manufactured or sold, the gross pro rata royalty for each essential patent holder would be $.0044, not considering any applicable taxes and licensing costs. The royalty due from a camcorder manufacturer which incorporates both an encoder and decoder would be $6, or .15% of the retail price, assuming a price of $400. If the camcorder incorporates a patent of each essential patent holder where the unit is manufactured or sold, the gross pro rata royalty for each essential patent holder would be $.67, not including any applicable taxes and licensing costs.

[33] The "Amended and Restated Limited Liability Company Agreement of MPEG LA," cited extensively in the Review Letter, *supra*.

appropriate for inclusion in the pool.[34] (To give some sense of the complexity involved, the MPEG lawyers began by studying over 8,000 patent abstracts, owned by over 100 companies and inventors; narrowed the field to 800 patents, and eventually identified the 27 Essential Patents, most of which also have foreign counterparts.)[35] New patents are being added all the time as they are being granted by patent offices around the world.[36] If so, there is a mechanism for recalibrating the internal royalty split among members in light of the new technology.[37] This is an example of an internal "liability rule," i.e., a set of rules

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[34] The licensors' request for a Business Review from DOJ says:

> [E]xtreme care has been taken to insure that the proposed licensing program includes only blocking or essential patents and a structure has been devised both to remove from the program any patents hereafter shown to be non- essential and to include at a later date any other patents that are deemed essential.

Cf. Sabra Chartrand, "The Federal Government Will Allow A Group Of Companies To Unify Administration Of 27 Patents," June 30, 1997, at p. D 8 ("Mr. [Baryn] Futa [president of MPEG LA, the corporate entity that administers the MPEG 2 pool] said that 27 patents 'is only an introductory number' and that more would be added.").

[35] Barry Fox, Replicators Risk Drowning In A Growing Pool Of Patents, One to One, Mar. 18, 1998, at p. 63.

[36] According to the trade press, for instance: "Lucent Technologies (Bell Labs) and Toshiba are expected to join [the pool] soon and add more patents." *Id*.

[37] From the MPEG 2 "Request Letter" preceding the DOJ Review Letter:

> The Agreement establishes an Administrative Committee (Article 3) consisting of a representative of each licensor. The Administrative Committee has responsibility for selecting the Licensing Administrator, and reviewing certain activities of the Licensing Administrator. The Licensing Administrator, however, and not the Administrative Committee or individual licensors, has exclusive responsibility to identify and solicit potential portfolio licensees, audit sublicensees, determine back royalties which potential licensees may owe, bring actions to enforce a Portfolio License and other licensing administration matters (Article 3.5.4). The Agreement Among Licensors also provides the formula for apportioning royalty income among licensors (Article 5.1) as well as a basis for dividing any joint expenses or liability which may arise (Article 5.2, 5.3). The licensors agree to reimburse certain of the expenses which were incurred by CableLabs in connection with the patent search and other efforts to organize the proposed licensing program (Art. 5.3.2). The Agreement also provides the procedures for removing existing or adding new essential patents to the Portfolio License -- whether such new patents are held by the original licensors or other entities -- and provides that any new licensor will reimburse the original licensors

and norms for determining the value of a new, patented technology. The administrative structure of the pool substitutes technical expertise by the members (and the pool's staff)) for that of the courts. This effectively converts members' property rights from "property rule" entitlements to administratively-determined liability rule entitlements.

In some sense, the prevalence of standard-setting and pooling show the reduced threat of a single dominant property right in contemporary markets. Thus these arrangements suggest a diminished chance that we must inevitably face a clash of the magnitude of the *Charles River Bridge* case. At the same time, standard-setting and pooling provide a potentially useful template to guide policy. If the legal system ever *does* confront a head-on clash between property rights and innovation, courts could turn to private standard-setting and pooling arrangements as a useful remedial model. Unlike the established (though almost forgotten) remedy of compulsory licensing, a standards/pooling-oriented remedy would require careful thought in setting the terms of participation for a patentee subject to the remedy.

3.2 Doctrinal Sources

To summarize the foregoing: patents must often be integrated for a standard to be established; and antitrust law has shown some sensitivity to the social welfare gains that can flow when this integration is achieved through a private institutional framework for inter-firm bargaining.

> $25,000 for certain start-up expenses which the original licensors incurred (Articles 2, 6).

There is a cap on the upward revision of royalty rates over the short term, however:

> The Portfolio License expires in 2000, but each licensee is given the option to renew the license for an additional period of five years (Art. 6.1). Licensees are assured that royalties will increase, if at all, by no more than 25% for the five year renewal period.

DOJ Business Review Letter, *supra*.

Still, there is always the possibility that a firm will acquire a broad, pioneering patent that in effect covers a technological standard. Short of this, control over a standard may be achieved through a portfolio of related patents, some of which may be acquired from independent firms. Should this occur, and should questions arise about the effects of the patent(s) on interoperability, the legal system will have to decide whether the general principle of the copyright cases should be imported into patent law. This section discusses what factors might figure in such a decision, and suggests some doctrinal innovations that could get the job done.

Mark Lemley, in the article cited earlier, analyzes how legal doctrine and policy might be brought to bear on the problem of proprietary standards:

> One possible solution to the Internet standardization problem is to make the competing standards interoperable. If people can switch back and forth between competing versions of what is essentially the same standard, perhaps society can capture the benefits of competition without wasteful duplication of effort, and without stranding consumers who make the wrong choice. There are at least three . . . possible ways such interoperable standards could be achieved. . . . First, one might interpret the intellectual property laws to achieve this effect. In the particular context of the computer industry, a single company can establish a de facto standard only if it is able to exclude others from using that standard. Absent intellectual property rights in the software constituting the standard, the would-be monopolist would have no way to prevent others from selling the standard as well. Therefore, one possible solution to the de facto standards problem would be to preclude companies with a dominant market position from enforcing their intellectual property rights in the standard. Such a scheme might be workable, though it would require careful attention to the problem of ensuring that intellectual property owners retained adequate incentive to develop software in markets characterized by standardization. Alternatively, intellectual

property law could provide a built-in mechanism to achieve interoperability with an industry standard.[38]

As a general proposal, this seems coherent enough. Yet still one feels the need to find some doctrinal support for such a radical proposal. Putting aside the traditional (though long-overlooked) antitrust remedy of compulsory licensing, where *within* intellectual property is there precedent for such an approach?

3.2.1 Patent Misuse

A good starting place is the doctrine of patent misuse. Some patent misuse cases seem to at least speak the language of the "disproportionate leverage" principle of the copyright cases reviewed earlier. By no means is this the grand unifying principle of misuse law. Indeed, there is no such principle, as many have recognized. My claim is simply that at least *some* misuse cases turn on an intuition akin to "disproportionate leverage." And these cases provide the conceptual bridge to the copyright cases we reviewed earlier. Out of this rough similarity, a willing judge could use patent misuse to fashion a result that furthered the policy of interoperability.

To see why I believe patent misuse is malleable enough to reach such a result, consider some cases providing a recent statement of the doctrine. Misuse is most often these days defined as a situation where "the patentee has impermissibly broadened the 'physical or temporal scope' of the patent grant with anticompetitive effect."[39] This is often stated by means of formulations such as the following:

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[38] Mark Lemley, *Antitrust and the Internet Standardization Problem,* **28 Conn. L. Rev. 1041, 1060-1061 (1996).**

[39] Windsurfing Int'l, Inc. v. AMF, Inc., 782 F.2d 995, 1001, 228 USPQ 562, 566 (Fed. Cir.1986) (quoting Blonder-Tongue Lab., Inc. v. University of Ill. Found., 402 U.S. 313, 343(1971)).

> When a practice alleged to constitute patent misuse is neither per se patent misuse nor specifically excluded from a misuse analysis by § 271(d), a court must determine if that practice is "reasonably within the patent grant, i.e., that it relates to subject matter within the scope of the patent claims."[40]

Antitrust experts have often criticized the vagueness of this standard. Judge Richard Posner, for example, said the following in an opinion from early in his tenure on the Seventh Circuit:[41]

> If misuse claims are not tested by conventional antitrust principles, by what principles shall they be tested? Our law is not rich in alternative concepts of monopolistic abuse; and it is rather late in the day to try to develop one without in the process subjecting the rights of patent holders to debilitating uncertainty.

Despite these doubts, and despite recent legislation further constraining the doctrine,[42] patent misuse survives as an odd but stubborn variant of antitrust law. The

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[40] Virginia Panel Corp. v. MAC Panel Co., 133 F.3d 860, 869 (Fed.Cir. 1997), quoting from Mallinckrodt, Inc. v. Medipart, Inc., 976 F.2d 700, 708 (Fed.Cir.1992).

[41] USM Corp. v. SPS Technologies, Inc., 694 F.2d 505, 512 (7th Cir. 1982) (Posner, J.).

[42] As finally adopted in 1988, the newly amended version of this section reads as follows (note that subsections (4) and (5) are new):

> § 271. Infringement of patent
> ....
> (d) No patent owner otherwise entitled to relief for infringement or contributory infringement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of having done one or more of the following: (1) derived revenue from acts which if performed by another without his consent would constitute contributory infringement of the patent; (2) licensed or authorized another to perform acts which if performed without his consent would constitute contributory infringement of the patent; (3) sought to enforce his patent rights against infringement or contributory infringement; (4) refused to license or use any rights to the patent; or (5) conditioned the license of any rights to the patent or the sale of the patented product on the acquisition of a license to rights in another patent or purchase of a

Federal Circuit continues to hew to the older cases, notwithstanding criticism from antitrust quarters.[43] And although Judge Posner was no doubt being facetious when he suggested that a continuing role for the doctrine could be justified if it were read as "condemn[ing] any patent licensing practice that is even trivially anticompetitive, at least if it has no socially beneficial effects,"[44] he may in fact be on to something. There may be a separate role for misuse, related to but apart from mainstream antitrust law. Indeed, formulating the issue as one of "impermissible" patent scope calls to mind the heavily policy-laden series of doctrines by which patent law calibrates an inventor's property right according to the magnitude of his or her contribution, the prospect of follow-on inventions, and other factors.[45] Seen from this perspective, the law of misuse could easily adopt the promotion of interoperability, at least at the margin, as one of its animating policies.

To clarify the potential role that patent misuse might serve, consider a hypothetical variant on a recent tying case decided under misuse law.[46] Imagine a firm

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> separate product, unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned.

35 U.S.C. § 271(d) (1986 & Supp. VI 1991); subsections (4) and (5) added by H.R. 4972, P.L. 100-73 (102 Stat. 4674), 100th Cong. 2d Sess. 1988.

[43] *See, e.g.*, Senza-Gel Corp. v. Seiffhart, 803 F.2d 661, 665 (Fed. Cir. 1986) ("We are bound . . . to adhere to existing Supreme Court guidance in this area . . . .").

[44] USM Corp., *supra*, 694 F.2d at 512.

[45] Robert P. Merges, Patent Law and Policy (2d ed 1997), at Ch 11, pp. 1193 ("[P]atent misuse is actually a matter of patent scope."). For an overview of the economic considerations now seen as central to scope determinations, see Robert P. Merges and Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 Colum. L. Rev. 803 (1990); Jerry R. Green & Suzanne Scotchmer, On the Division of Profit in Sequential Innovation, 26 RAND J. Econ. 20 (1995).

[46] The case is In re Recombinant DNA Tech. Patent & Contract Litigation, 850 F.Supp. 769, 775 (S.D.Ind. 1994), which held (1) that implicit tying arrangements (in this case, a broad, unilateral termination clause) can be just as effective as covenants expressly , and thus can constitute patent misuse; and (2) the 1988 amendments to 35 USC § 271(d),

called Digital Compression, Inc. ("DCI"), that owns a patent on one aspect of digital compression employed in DCI's technology. DCI's product is one of several emerging standards in the area of digital data compression. This technology is important because it facilitates many data-intensive applications expected to grow very rapidly in coming years: sale of high-resolution digital content such as movies in convenient compressed formats; rapid transmission of content over the Internet; and the like. DCI's business strategy team believes that DCI's proprietary compression technology could be a springboard to lucrative applications. In particular, DCI has focussed on digital "streaming" technology, which allows high-resolution digital content, especially radio programs such as music, to be transmitted in "real time" over the Internet. To move aggressively into streaming, DCI decides that it will henceforth license its compression technology only with its proprietary, compatible streaming technology.

Now imagine there is an established player in the music streaming business; call it Fluid Audio ("Fluid"). Fluid licenses its technology to content providers who want to "stream" data to users. These providers want to produce streaming technology that is compatible with the three major compression technologies. DCI, however, with its desire to move into the streaming field, bundles its streaming technology with its data compression software. Moreover, Fluid claims, DCI's technology is "hostile" to Fluid's; users report difficulty using Fluid's streaming technology with DCI's compression format. In response, Fluid "reverse engineers" DCI's compression software, in an attempt to rework Fluid's streaming technology so it works more effectively with the DCI format. In the process, Fluid infringes DCI's patent. DCI sues for patent infringement.[47]

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adding the "market power" requirement for misuse/tying cases, applied to tie-outs as well as tie-ins.

[47] Even if the version of Fluid's product that is offered for sale does not infringe DCI's compression patent, Fluid necessarily had to "make and use" DCI's technology, without DCI's authorization, in the course of the reverse engineering process. Hence there was patent infringement, and arguably DCI could enjoin all sales of Fluid's DCI-compatible streaming product. To re-emphasize an earlier point: there is no "fair use" defense in patent law. In theory anyway, once infringement is established, that is the end of the analysis.

An antitrust counterclaim by Fluid would encounter a number of problems:

- The bundled compression/streaming product is arguably an "integrated product" and not a tie-in, putting it outside antitrust scrutiny;[48]
- Even if DCI's conduct was thought to constitute a tie, it may not have demonstrable market power (yet); and
- There may be a plausible business justification under antitrust law based on synergies and operational advantages of DCI's integrated product.[49]

Patent misuse might provide a viable defense or counterclaim here. With the interoperability policy in mind, a court might well resolve the case in favor of Fluid despite "technical" problems with its antitrust defense.[50] One important consideration that

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[48] *See* United States v. Microsoft Corp., 147 F.3d 945 (D.C. Cir. 1998) (interpreting earlier consent decree, but also relying on general tie-in law and academic commentary for "plausible benefits" version of integrated product test).

[49] A recent paper surveys the close relationship between efficiency considerations at the "integrated product vs. tie" stage of the analysis, and (still controversial) de facto justifications for "per se" anticompetitive conduct; see Alan J. Meese, "Monopoly Bundling in Cyberspace: How Many Products Does Microsoft Sell?," January 6,1999, Working Paper, abstract available from the SSRN Electronic Abstracts Collection (www.ssrn.com).

[50] *Cf.* In re Recombinant DNA Tech. Patent & Contract Litigation, 850 F.Supp. 769, 775 (S.D.Ind. 1994), which dealt with a licensing agreement allowing Genentech to terminate if licensees used unpatented materials supplied by a competitor. The court discussed whether this termination provision was equivalent to an explicit "condition on purchase":

> Although the Insulin and hGH Agreements grant Lilly and Kabi, respectively, both unpatented materials and patented technology, we do not believe this sufficiently distinguishes the instant case from others in which per se patent misuse historically has been found. It is clear that Genentech's contractual right to terminate the agreements should the licensees sell recombinant insulin or hGH for which Genentech receives no royalty includes the right to cancel the patent license of the licensee. The retention of such a right appears to use the patent as leverage to insure that the licensee will not use the microorganisms and the technology of competitors. This type of tying arrangement previously has been condemned as per se patent misuse. Moreover, the fact that the provisions are rights to terminate rather than

such a court *might* rely on is the relationship between DCI's patent and the markets for data compression formats and streaming technology. In deciding on the legitimacy of DCI's attempt to use its data compression format to advantage its streaming technology, a court might well be influenced by the *significance* of the patented component of the compression format. It is at least relevant in a misuse analysis – aimed, you will recall, at deciding whether the patentee "impermissibly broadened" its patent – whether the patented technology was a major contribution or simply a routine component-level invention. If the latter, courts might fall back on well-accepted jurisprudence regarding patent scope. Under this law, non-pioneering inventions receive a lesser degree of protection than pioneering ones.

Applied this way, patent misuse mirrors some of the caselaw on the "doctrine of equivalents."[51] In addition, it begins to reflect more explicitly some of the same concerns that have permeated software copyright cases for the last decade. In short, misuse begins to look like a proper vehicle for resolving – with due sensitivity to the nature of patents, and again at the margins – issues of interoperability in a world of networks and standards.

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explicit prohibitions on the licensees' use of competitors' products does not lessen their impact.

The court went on to hold, however, that the license agreement should be scrutinized in light of the 1988 amendements to the Patent Act, which require market power in the tying and patented product. *See also* C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340 (Fed. Cir.), rehearing denied, 161 F.3d 1380 (1998) (upholding jury verdict on uncontested instruction that it was misuse to change the design of an unpatented biopsy needle kit with the intent to render competitors' designs for unpatented needle components incompatible). *But cf.* Micro Chemical, Inc. v. Great Plains Chemical Co., 900 F.Supp. 1386, 1398-99, 1404-05 (D.Colo. 1995), aff'd in part and rev'd in part, remanded, 103 F.3d 1538 (Fed.Cir. 1997), (district court declared that in the absence of an express agreement, coercion is necessary to find an implicit tying arrangement)

[51] *See* Merges and Nelson, *supra*; Merges, Patent Law and Policy, *supra*, Chap. 8 (Infringement).

Though they do not rely explicitly on misuse cases, several commentators have called for something akin to an "interoperability" principle in patent law as well.[52] Thus there is support, from at least some quarters, for an expansion of the interoperability notion at least partially into the domain of patents.

3.2.2 The "Reverse Doctrine of Equivalents"

I stated earlier that there is no "fair use" principle in patent law. This is not quite true. An obscure doctrine called "reverse equivalents" is a colorable approximation. Under this doctrine, a literal infringer whose technology is "so far changed in principle" as compared to the patentee's is let off the hook. One problem with the doctrine is that it has not been used, outside the law reviews, in over 100 years. Another is that it is a frightening anomaly, with seemingly little support in the overall fabric or history of patent law. And finally, it has been somewhat of a "darling" of academics – a surefire recipe for obscurity in patent law.

Having said all this, it should be noted that the doctrine has been recognized, though not applied, in a number of recent cases.[53] Furthermore, it has been explained as a

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[52] Julie Cohen, *Reverse Engineering and the Rise of Electronic Vigilantism: Intellectual Property Implications of "Lock-Out" Programs*, **68 S. Cal. L. Rev. 1091, 1096-97 (1995)**:

> I argue that neither the copyright laws nor the patent laws preclude duplication of protected program features, including "lock" and "key" features, to whatever extent necessary to achieve full compatibility with an unpatented computer system. . . . [T]his Article argues that certain adjustments to the copyright and patent doctrines governing the protection of computer programs are necessary if the intellectual property laws are to continue to serve both their new and their traditional functions.

See also Mark Lemley, *Antitrust and the Internet Standardization Problem*, **28 Conn. L. Rev. 1041, 1042-1043 (1996)**, discussed later in the text.

[53] *See, e.g.*, Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 18 U.S.P.Q.2d (BNA) 1001, 18 U.S.P.Q.2d (BNA) 1896 (Fed. Cir. 1991).

mechanism that could be brought to bear in the much-studied dynamic between pioneer inventors and improvers.[54] To be specific, I have proposed that even a modest threat that an infringer will be let go, free of liability, would have a salutary effect on pioneer-improver bargaining where the pioneer's patent is used as a "holdup" right to extract significant rents from a "radical improver."[55]

It is impossible to predict whether a court would be bold enough to apply these ideas in an actual case. At the same time, it is useful to keep in mind one general point from this literature: that doctrines limiting property rights can exert an important influence at the margin on parties deciding whether or not to voluntarily license patented technologies. We return to this "bargaining in the shadow of legal rules" point a few paragraphs later.

3.3 Analogy: Partial Genericide in Trademark Law

As presented here, patent misuse and "reverse equivalents" can be restated as follows: if you are successful enough – if you invent a technology that becomes a standard – we will take away your property right. This is about the starkest and most radical statement of the principle possible. Yet stating it this way allows us to see that indeed there is a corollary in intellectual property: the rule of "genericide" in trademark law, which says that you lose your trademark when it attains widespread use as a general product descriptor. Unlike total genericide, which results in the complete loss of

[54] *See* Robert P. Merges, *A Brief Note on Blocking Patents and the Reverse Doctrine of Equivalents in Biotechnology Cases*, 72 J. Pat. & Trademark Off. Soc'y 870 (1991).

[55] Robert P. Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 Tenn. L. Rev. 75 (1994) (arguing that reverse doctrine of equivalents can be used to influence reluctant pioneers looking to exert "holdup rights" on radical improvers). See also Suzanne Scotchmer & Jerrry Green, *On the Division of Profit in Sequential Innovation*, 26 Rand J. Econ. 20 (1995) (describing empirically rare case where pioneer can bargain in advance with improver).

trademark rights,[56] partial genericide results in the loss of rights in only part of a name. Because I assume only that part of a standard must be made unenforceable – enough to allow interoperability – the best analogy is to the doctrine of "partial genericide."

Coca-Cola is at the center of the leading cases on partial genericide.[57] In Coca Cola Co. v. Snow Crest Beverages, for example,[58] the court stated:

> [T]he plaintiff has no monopoly on the use of the word "Cola" in the name of its beverage. It has been held that the word is generic and therefore may be used in the name of a cola drink by any one who chooses to make such a beverage.

The remarkable aspect of genericide is that trademark rights are lost despite the best efforts of the mark's originator to prevent it. The word at issue, originally chosen because it was distinctive, passes into the public domain through countless acts of private, uncontrolled use. Often, the process occurs because the trademarked term was so

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[56] *See, e.g.*, Heroes, inc. v. The Boomer Esiason Hero's Fdn., inc., 43 U.S.P.Q.2d 1193, 1196 (D.D.C. 1997):

> A registered trademark or service mark, valid when issued, may become generic over time, and therefore subject to cancellation. § 15 U.S.C. Section 1064(3). The former trademark Aspirin, for example, has become simply "aspirin," a generic term for a particular product. And former trademarks Cellophane, Escalator and Thermos have met the same fate, often known as "genericide."

[57] There is a related line of cases holding that an entire trademarked name has become a generic description of a certain class of goods, while still retaining distinctiveness with regard to other classes. *See, e.g.*, Dresser Industries, Inc. v. Heraeus Indus. Vacuum, Inc., 395 F.2d 457, 465-466 (3d Cir. 1968):

> [A]n arbitrary name can hardly become generic as applied to all of a wide variety of products of a manufacturer. But this is not to say that such a name may not become generic as to one of those products. Indeed, as Judge Willson found from ample evidence, this is exactly what has happened here . . . .

[58] 162 F.2d 280, 283, 73 U.S.P.Q. 518 (1st Cir.), cert. denied, 322 U.S. 809 (1947). *See also* Dixi-Cola Laboratories, Inc., v. Coca-Cola Co., 117 F.2d 352 (4th Cir.), certiorari denied 314 U.S. 629 (1941).

well chosen, it quickly becomes the standard way to refer to an entire category of products. It is a clear case of the trademark originator being punished for its success.

This aspect of genericide comes through strongly in the following passage from another of the Coca-Cola cases, which begins by recognizing that the Coca-Cola Company originated popular use of the term "cola":[59]

> [I]t is important to inquire whether or not the word "cola" has a descriptive significance apart from its use in the trade- mark Coca-Cola, and has become a generic term, generally used to indicate a class of beverage. The answer is to be found, we believe, in scientific and popular literature, [and] in the discussions of Coco-Cola cases by the courts . . . The beverage was devised and the name Coca-Cola was adopted by John S. Pemberton in Atlanta in 1886. The product was sold under a label registered in the Patent Office, which advertised Coca-Cola syrup as an extract for carbonated beverages possessing a peculiar flavor and the tonic and nerve stimulant qualities of the coca plant and cola nuts.

The court then turned to the question of trademark protection for the term "cola":[60]

> It is true that the name identifies the goods of the plaintiff, but it has also come to characterize them. This process has been hastened by the fact that the combination of extract of coca leaves and extract of cola nuts employed by Pemberton was new, and it gave to the product a new and distinctive flavor for which there was no other name than that which he employed. Hence the drink came to be known to the public by this name . . . The process was further stimulated by the great public response to the drink and the activities of numerous competitors who speedily entered the field and were enabled lawfully to make the same or a similar beverage, since Coca-Cola was not covered by a patent.

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[59] 117 F.2d 352, 355.

[60] 117 F.2d 357-358.

Next the court considered the legal significance of the fact that "cola" had come to be used by the public to refer to a class of soft drinks, rather than specifically to Coca-Cola:

> The adoption of the word "cola" to characterize a class of drinks thus came about very naturally, to some extent with the consent of the Coca-Cola Company . . . and to a greater extent because in the course of events it could not be prevented. It was attended by a vast increase after 1886 in the literature relating to the cola nut and its uses. Publications of various types recognized the fact that it could be used as an ingredient of a soft drink. Numerous references to the cola nut and to cola syrup and extract and their use in beverages, called cola drinks, appeared throughout the following years in dictionaries, encyclopedias, pharmaceutical magazines, trade journals and government publications. During the same period the word was adopted as part of the trade name of a large number of competing beverages.[61]

Finally, the court considers the legal importance of Coca-Cola's role as originator of the term, as well as its efforts to prevent use of "cola" in a generic sense:[62]

> No reported case has come to our attention which distinctly holds that the word "cola" cannot be used as part of a name of a beverage provided that the whole name is not confusingly similar to Coca-Cola. It is urged, however, that we should make such a decision in this case for the reasons, which found favor in the District Court, that no such thing as a cola beverage in the present sense of the term, was known or spoken of prior to the advent of Coca- Cola in 1886, and that the Coca-Cola Company has always asserted its claim to the exclusive use of the term. In our opinion, these considerations, even if sustained by the evidence, are

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[61] 117 F.2d 352, 357-358.

[62] 117 F.2d 352, 362 (emphasis added).

> not controlling . . . . When one has a monopoly of the initial distribution of a specific article over a period of time, and especially if the descriptive name for the article is one difficult to pronounce or remember, there is a likelihood that the designation which he adopts as his trade-mark for the article will be incorporated into the language as the usual generic designation for an article of that type. When that happens, the designation becomes merely descriptive of the goods and no longer identifies a particular brand or performs any of the functions of a trade-mark or trade name. *Moreover, the designation must then be used by others if there is to be any effective competition in the sale of the goods. It is immaterial that the person first adopting the designation made every reasonable effort to avoid this result or that the designation was coined by him and derived meaning only from his use . . . .*

It might seem that the notion of genericide does not make much sense. Why should a mark pass into the public domain because it has come to signify a category of products rather than a single product/source combination? Where the trademark owner "invents" the trademark, there is a clear sense in which the genericness doctrine takes away some rights that the creator was endowed with because of her creativity. Genericide thus seems in conflict with the basic premises of trademark law; it attempts a rough "calibration," along the lines of patent and copyright, to adjust the incentive to call forth the optimum (or at least desirable) level of this activity, rather than providing a permanent, blanket incentive.[63]

In some ways, genericide is analogous to the argument that copyright protection on a software user interface should "lapse" when the interface becomes a standard.[64] The unifying theme is the notion that the success of certain kinds of creative works is largely

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[63] *Cf.* William M. Lande & Richard A. Posner, *Trademark Law: An Economic Perspective,* **30 J.L. & Econ. 265, 270 (1987)** (trademark protection offers a modest incentive to create new commercial terms).

[64] . *Cf.* Lotus Devel. Corp. v. Borland Int'l, Inc., 49 F.3d 807 (1st Cir. 1995), *aff'd by equally divided court,* 116 S.Ct. 804 (1996).

a result of the need for a single standard, rather than the creative brilliance of the work itself.[65] Economists speak of these works as creating "network externalities": users benefit from the fact that other users use the work.[66] Widely used computer protocols, such as a World Wide Web "browser," are advantageous because they make a wide variety of content available to all users.[67] Thus each new person who adopts a protocol benefits all current users of the protocol.[68]

Economists have observed that human[69] languages exhibit network externalities, which explains why "standard" languages tend to emerge.[70] The same logic would seem

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[65] Contrast this view with a thoroughly unconvincing account of genericide: that it operates to remove property rights from a party who is not making use of them. *See* Kenton K. Yee, *Location.Location.Location: Internet Addresses As Evolving Property***, 6 S. Cal. Interdisciplinary L.J. 201, 201 (1997)** (analogizing genericide to the doctrine of "adverse possession" in real property, which "optimize[s] social welfare by removing from owners the property rights which they do not make adequate use of.").

[66] The standard citation is Paul A. David, Clio and the Economics of QWERTY, 75:2 Am. Econ. Rev. 332 (1985). Liebowitz & Margolis have cast doubt on the supposed superiority of the Dvorak keyboard. See S.J. Liebowitz & Stephen E. Margolis, The Fable of the Keys, 33 J.L. & Econ. 1 (1990). *Cf.* Jared Diamond, The Curse of QWERTY, Discover, Apr. 1997, at 34 (reviewing arguments for qwerty inferiority).

[67] The standards issue is well reviewed in Mark Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 **California Law Review** 479 (1998).

[68] *Cf. ." See* Mark Lemley & David McGowan, *Could Java Change Everything? The Competitive Propriety of a Proprietary Standard*, **43 Ant. Bulletin 715 (1998)**.

[69] Including those created for computers. Elizabeth G. Lowry, Comment, *Copyright Protection for Computer Languages: Creative Incentive or Technological Threat?*, 39 Emory L.J. 1293, 1340 (1990) (arguing that as of the early 1990s, Ashton-Tate's "dBase" database programming language had become a standard):

> DBase has been the standard database language for database management system developers in recent years. With an established standard, developers can concentrate their investments on innovations to a language instead of creation of a new language. Protection of a standard like dBase would force competitors to "reinvent the wheel" in order to develop a competitive product.

to apply to individual words. When a word comes to describe a genus or class of goods, i.e., enters general use, it takes on some of the properties of the computer protocol described earlier. It becomes the standard shorthand descriptor for a type of product. Past a certain point, any alternative descriptor becomes clearly second-best. Requiring consumers and competitors to use this second-best descriptor entails costs.[71]

Consider the example of "Yo-Yo". How would you describe one without using the word itself? Perhaps: "rotating toy on a string"? Or, as an alternative, perhaps one requiring some explanation, "wheel on a string"? The crying need for a simple term to describe the toy no doubt accounts for the fact that "yo-yo" has now "gone generic."[72] And this example shows the common sense behind genericide. Yo-yo, a good term to describe the toy, becomes widely adopted as the standard way to refer to it. Each "adoption" decision, standing in isolation, is trivial; but in the aggregate, there is an appreciable collective investment. Dictionaries are revised, toy company catalogues are printed, and, most importantly, millions upon millions of English speakers learn that the word "yo-yo" applies to a certain type of toy on a string.[73] As each speaker "adopts" the

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[70] Michael I. Krauss, *Regulation vs. Markets in the Development of Standards*, **3 S. Cal. Interdis. L.J. 781, 796 (1994)**:

> Language is another standard. We want to speak and write in a form that is comprehensible to the people with whom we wish to communicate, and so societies tend to develop common languages. When standards compete, the adoption of one (e.g., English as the current lingua franca of commerce) is not unrelated to its efficiency.

[71] *See* Ralph H. Folsom and Larry L. Teply, *Trademarked Generic Words*, **89 Yale L.J. 1323, 1340-41 (1980)** ["Folsom and Teply."] Though difficult to quantify, these costs may be substantial. *See also* Landis and Posner, *supra*, at 280, 292 (discussing costs of having to "describe around" a well-known term).

[72] *Cf*. Donald F. Duncan, Inc. v. Royal Tops Mfg. Co., 343 F.2d 655 (7th Cir. 1965) (holding Yo-Yo generic, besides being descriptive in Filipino language).

[73] Dictionary usage is not the only determinant of genericide, though it is persuasive. *See* William M. Landis & Richard A. Posner, *Trademark Law: An Economic Perspective*, **30 J.L. & Econ. 265, 296 (1987)** ("Thus, although words held to be generic are more likely

word, its value grows: subsequent speakers know that once they learn it, they can speak cogently about this type of toy to all the other English speakers who already know it. In the process, yo-yo becomes a common term with a unique referent, viz., that particular type of toy. In short, it becomes a *standard linguistic descriptor*. The same occurs each time a well-chosen term becomes generic under the law of trademarks.[74]

The cost of reversing the use of the term as a generic product descriptor is obviously very high. This explains why, to prevent genericide, firms often spend a good deal of money on "educational" advertising (e.g., "There is no such thing as a Xerox.")[75] Such expenditures show that the cost of informing the public about alternative product descriptors is worth it to the firm, given its investment in its trademark.[76] Of course, it may be impossible for a company to prevent genericide, for example, when a trademark achieves rapid and overwhelming acceptance.[77] Then no amount of policing will work.[78]

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to show up in the dictionary than those held not to be generic, the difference in probabilities is small--54% versus 41%.").

[74] Consider "plexiglass." The next best alternative to this well-known descriptor might be: "unbreakable clear plastic sheets, or window material." That is not only a mouthful; it is more expensive to advertise (because longer); harder to remember; and more subject to mistakes and confusion. Thus it is not hard to see why "plexiglass" became the preferred shorthand for it. Consequently, although the originator of this term might have put substantial efforts into creating it and encouraging its use, there is a good argument that it has become a standard name (or descriptor) -- and hence, generic. *But cf.* Rohm & Haas Co. v. Polycast Technology Corp., 172 U.S.P.Q. 167 (D. Del. 1971) (enjoining defendant's use of PLEXIGLASS mark.

[75] *Cf.* Markwatch Licensing Page (visited Mar. 17, 1999) <http://www.markwatch.com/license/> (describing "Markwatch," a service that will monitor the Internet for trademark "infringement, dilution, and genericide situations").

[76] *Cf.* E.I du Pont de Nemours & Co. v. Yoshida Int'l, Inc., 393 F.Supp. 502, 523-24 (E.D.N.Y. 1975) ("TEFLON" not generic in part due to vigorous education and policing campaign by du Pont).

[77] Apart from general advertising such as this, firms also police the uses of their marks via lawsuits. *See, e.g.*, Selchow & Righter Co. v. McGraw-Hill Book Co., 580 F.2d 25, 198 U.S.P.Q. 577 (2d Cir. 1978) (granting SCRABBLE trademark holder preliminary injunction against publisher of "The Scrabble Dictionary," on grounds that publication would cause irreperable injury by possibly rendering trademark generic); Elliot Staffin,

Such rapid acceptance indicates that the next best alternative descriptor is significantly less effective.

To be sure, some alternative terms are better than others. “Lip balm,” as an alternative to “CHAP STICK,” works fairly well, while “dextro-amphetimine sulphate,” is a poor alternative to “DEXADRINE.”[79] One commentator advocates a cross-elasticities of demand analysis to determine the degree of substitutability between terms, to be used in genericide analyses.[80]

3.3.1 Problems with the Genericide Analogy

The basic problem with the genericide analogy is one we saw earlier in the discussion of interoperability in copyright law. Before one imports concepts from trademark into patent law, one must confront the argument that many of the limitations of

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The Dilution Doctrine: Towards a Reconciliation with the Lanham Act, **6 Fordham Intell. Prop. Media & Ent. L.J. 105, 117 (1995)** (collecting recent cases finding that dilution causes of action may lie against those employing a trademark in a way that threatens to make it generic). *Cf*. Ralph H. Folsom and Larry L. Teply, *Trademarked Generic Words*, **89 Yale L.J. 1323, 1346-47, n. 110 (1980)**(describing organized efforts of trademark attorneys to pressure dictionary publishers into excluding trademarked words, and/or including disclaimers that such inclusion should not bear on genericide issue).

[78] . *Cf*. Du Pont Cellophane Co. v. Waxed Prods. Co., 85 F.2d 75 (2d Cir.), *cert. denied* 299 U.S. 601 (1936) ("CELLOPHANE" generic despite vigorous policing efforts).

[79] *Cf*. Folsom and Teply, *supra*, at 1344 (noting these examples). Consider further the following examples: Haughton Elevator Co. v. Seeberger, 85 U.S.P.Q. 80 (Dec. Com. Pat. 1950) (canceling "escalator" trademark as generic); King-Seeley Thermos Co. v. Aladdin Indus., Inc., 321 F.2d 577, 138 U.S.P.Q. 349 (2d Cir. 1963) (“Thermos”); Bayer Co. v. United Drug Co., 272 F. 505 (D.C.N.Y. 1921) (“Aspirin”); DuPont Cellophane Co. v. Waxed Prods. Co., 85 F.2d 75, 30 U.S.P.Q. 332 (2d Cir.) (“Cellophane”), cert. denied, > 299 U.S. 601, 299 U.S.P.Q. 601 (1936).

[80] Comment, *Trademarks and Generic Words: An Effect-on-Competition Test*, **51 U. Chi. L. Rev. 868, 884-85 (1984)**.

trademark law are built in to prevent trademarks from becoming "backdoor patents." Thus, the limitations of trademark may have no place in patent law.

The prohibition on trademarks as "backdoor patents" is expressed nicely in the following passage from the famous (well, to IP lawyers anyway) "shredded wheat" case, Kellogg Co. v. National Biscuit Co.[81] Justice Brandeis set out a classic discussion of "genericide," though one infused also with elements of functionality and descriptiveness/secondary meaning:

> The plaintiff has no exclusive right to the use of the term "Shredded Wheat" as a trade name. For that is the generic term of the article, which describes it with a fair degree of accuracy; and is the term by which the biscuit in pillow-shaped form is generally known by the public. Since the term is generic, the original maker of the product acquired no exclusive right to use it. As Kellogg Company had the right to make the article, it had, also, the right to use the term by which the public knows it. . . . Ever since 1894 the article has been known to the public as shredded wheat. For many years, there was no attempt to use the term "Shredded Wheat" as a trade-mark. . . .
>
> Moreover, the name "Shredded Wheat," as well as the product, the process and the machinery employed in making it, has been dedicated to the public. The basic patent for the product and for the process of making it, and many other patents for special machinery to be used in making the article, issued to Perky. In those patents the term "shredded" is repeatedly used as descriptive of the product. The basic patent expired October 15, 1912; the others soon after. Since during the life of the patents "Shredded Wheat" was the general designation of the patented product, there passed to the public upon the expiration of the patent, not only the right to make the article as it was made during the patent period, but also the right to apply thereto the name by which it had become known.

[81] 305 U.S. 111, 116-118 (1938).

The same general theme resounds through the decades in various corners of copyright and trademark law. In general, both these bodies of law have developed doctrines that add up to another important principle: a prohibition on what I and co-authors have deemed "backdoor patents." The idea is that the weaker, lower-threshold property rights represented by trademark and copyright law must not be interpreted or employed in a way that duplicates the substantive protections of patent law. Both copyright and trademark are conceived as longer-lasting, but narrower rights; while patent law is said to be "short and broad."[82] The law has evolved rules that help prevent the emergence of "long, broad" rights – i.e., backdoor patents.

3.4 Bargaining in the Shadow of Pro-interoperability Rules in Patent Law

Where most property rights – particularly *intellectual* property rights – are concerned, direct state involvement in setting prices and orchestrating exchange is to be avoided. Thus voluntary cooperative contracting is the first-best outcome where patentees of standards-driven technologies must bargain with others who want access to the standard.

It is well understood now that legal entitlements can be designed so as to maximize the likelihood and influence the terms of post-grant bargaining. This is largely the point of the recent literature on "divided entitlements," for example.[83] No doubt the

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[82] I first heard the "long, thin" vs. "short, fat" phraseology from my colleague Pam Samuelson.

[83] *See, e.g.*, R. Merges, *Blocking Patents*, *supra*; Ian Ayres and Eric Talley, *Solomonic Bargaining: Dividing A Legal Entitlement To Facilitate Coasean Trade*, 104 Yale L.J. 1027, 1030 (1995):

> [W]e argue that divided entitlements can facilitate trade by inducing claim holders to reveal more information than they would under an undivided entitlement regime. Owners of divided, or "Solomonic," entitlements must bargain more forthrightly than owners of undivided entitlements, because the entitlement

ultimate goal of a “pro-interoperability” principle in patent law ought to be encouraging private bargaining. Ideally, such a doctrine would strongly encourage patentees who might otherwise “go it alone” on the strength of their patent(s) to join a voluntary standard-setting organization and/or patent pool, or at least license widely. Then the exchange-governance-coordination mechanisms described earlier would apply to the patentee in question, relieving some of the tension of the property rights/competition tradeoff. Again ideally, the result would be a world where, in effect, the owner of the Charles River Bridge negotiated a graceful entry strategy for a firm wishing to compete in part of the incumbent’s market, but cooperate in other respects (e.g., by giving advance notice in the event bridge service would close one of the bridges, or figuring out ways to reduce congestion in peak-traffic periods).

Of course, such cooperation is not inevitable. In fact, where the rules are unclear (or nonexistent!) it is very unlikely. Early test cases are the norm, because before parties can cooperate they must know their legal rights, which play a large part in determining their reservation prices. And perhaps, by the time the ground rules are set, conditions will change and a new competitive dynamic will ensue. But, since individual cases must be decided anyway, it’s best to do so on the assumption that today’s holding will set tomorrow’s incentives for various prospective future litigants.

> division obscures the titular boundary between "buyer" and "seller." More precisely, endowing each bargainer with a share of the underlying entitlement creates the possibility of two different types of Coasean trade: A bargainer might buy the other party's claim, or, alternatively, she might sell her own. During negotiation, each party is likely to be uncertain about whether she will ultimately emerge as a seller or a buyer. This strategic "identity crisis" can strongly mitigate each party's incentive to misrepresent her respective valuation; each party must balance countervailing interests in shading up her valuation, as one would qua seller, and shading down her valuation, as one would qua buyer. This form of rational ambivalence, we argue, can lead the bargainers to represent their valuations more truthfully.

But cf. Louis Kaplow and Steven Shavell, *Do Liability Rules Facilitate Bargaining? A Reply To Ayres And Talley*, 105 Yale L.J. 221, 222 (1995) (thorough critique of particular Ayres-Talley proposals).

4. Conclusion

Much of the preceding will sound vague and mushy to many readers. So let me recap my approach, and explain the soft-headed tone.

I began with a discussion of the *Charles River Bridge* case because it embodies one of the great clashes of economic interests and principles of its day. The case may be defended on any of a number of grounds: doctrine, economics, and so on. But ultimately it is understood as the embodiment of an economic policy or vision. It is in some sense ineluctably *political,* a statement of the Jacksonian worldview.

Today, or very soon at any rate, the contemporary incarnation of the issues presented in *Charles River Bridge* will play themselves out against the backdrop of intellectual property law. Now the cornerstone economic assets are increasingly information products of one sort or another, together with the property rights that cover them. The powerful dynamics of standards-driven markets create tensions between incumbent firms, with their installed bases and property rights portfolios, and the users of technology, together with would-be entrants who want access to the standard. The tension is likely to be resolved on the basis of economic policy, or a vision of what our basic principles should mean for competition in the software industry. There is inevitably a political dimension to such decisions; it is thus probably irrelevant whether considering allocational efficiency in isolation could resolve the issues. In this paper I have tried to discern some doctrinal bases courts might draw upon in resolving the important questions ahead. Some, such as copyright and patent misuse, are old. Others, such as the notion of "technological genericide," are novel. But I have also argued that more important than the technical doctrine are the concepts that underlie it. Just as deep concepts in the dominant legal regime of the nineteenth century – corporate law, contracts, and the constitution – held the key to resolving the formative *Charles River Bridge* case, the ascending regime of intellectual property law makes available the raw materials out of which we can build workable solutions to the coming clashes.

At the same time, it is well to remember that there are limits to the flexibility of our doctrines and principles. One important limitation that has grown more prominent in recent years is the constitional law of "takings." Indeed, in the very case with which we began, *Charles River Bridge*, Justice Story in dissent sounded a very modern theme indeed in condemning the "flexible," Jacksonian majority:[84]

> Although the sovereign power in free governments may appropriate all the property, public as well as well as private, for public purposes, making compensation therefor; yet it has never been understood, at least, never in our republic, that the sovereign power can take the private property of A. and give it to B., by the right of 'eminent domain;' or, that it can take it at all, except for public purposes; or, that it can take it for public purposes, without the duty and responsibility of making compensation for the sacrifice of the private property of one, for the good of the whole. These limitations have been held to be fundamental axioms in free governments like ours; and have accordingly received the sanction of some of our most eminent judges and jurists.

This is an important reminder. Though the clash between public purpose and private property will require some updating of our property rules, it may also occasion innovations in the law of takings. In so doing, we may well have to learn not only how to limit this new form of property, but how (and when) to "limit these [new] limits" as well.

[84] 420 U.S. at 642 (Story, J., dissenting).