



Volume 41 | Issue 1

Article 4

1996

Competition Policy and Intellectual Property in the Information Age

J. Beckwith Burr

Follow this and additional works at: <https://digitalcommons.law.villanova.edu/vlr>

 Part of the [Computer Law Commons](#)

Recommended Citation

J. B. Burr, *Competition Policy and Intellectual Property in the Information Age*, 41 Vill. L. Rev. 193 (1996).
Available at: <https://digitalcommons.law.villanova.edu/vlr/vol41/iss1/4>

This Symposia is brought to you for free and open access by Villanova University Charles Widger School of Law Digital Repository. It has been accepted for inclusion in Villanova Law Review by an authorized editor of Villanova University Charles Widger School of Law Digital Repository.

1996]

COMPETITION POLICY AND INTELLECTUAL PROPERTY IN THE INFORMATION AGE*

J. BECKWITH BURR**

I. INTRODUCTION

MORE than twenty-five years ago, the Department of Defense's Advanced Research Projects Agency undertook development of an experimental computer network known as "ARPANet," the technological embryo of what is now known as the Internet (the "Net"). In time, the Net's "backbone"—interconnected, high-power computers at government facilities—expanded to connect users to a worldwide network supporting activities in government, universities and industry labs. Today, we are all moving online to participate in a revolution that will profoundly alter the way we deliver, access and use information. Millions of American adults are connected directly to the Internet, and almost as many use commercial online service providers like America Online, Compuserve, and Prodigy. Anybody with a ten-year-old at home probably has a clear idea of just how conservative actual estimates can be. And, indeed, if there is consensus about anything in Washington, it is the fact that the technological convergence of previously distinct telecommunications, information and mass media industries now underway will drive world economics as we move from the twentieth to the twenty-first century.

The knowledge-based economy of the twenty-first century will require the United States to develop a sophisticated and reliable information infrastructure. Two realities will likely determine the respective roles of the public and private sectors in our transition into the information age. First, most Net users agree that the federal government should intervene only where the market is unlikely to develop solutions that respond to critical collective needs. Second, the federal government is not in a position to bank-roll cyberspace development. For better or worse, the U.S. contribution to

* This Article is available at the *Villanova Law Review* home page at http://vls.law.vill.edu/academic/jd/journals/law-review/Volume_41/.

** Attorney-Advisor to Commissioner Christine A. Varney, Federal Trade Commission; B.A., 1977, Yale University; J.D., 1987, Georgetown Law Center. The views expressed are those of the author and do not necessarily reflect the views of the Federal Trade Commission, any Commissioner or staff.

successful development of cyberspace depends on private investment.

If we accept the need for private investment to develop the National Information Infrastructure (“NII”), and if we have learned anything from our experience in the telephone industry, competition is the name of the game. Promoting competition may be the federal government’s most important contribution to the NII, providing the best assurance that the benefits of rapid technological change will be widely available and affordable. Robust competition in an increasingly global, technology-based economy is an important goal, but numerous challenges accompany its preservation.¹ It is unlikely that any regulatory system affecting pricing, market entry, or product and service characteristics could have moved quickly enough to keep up with the pace of change that we have seen in this environment in recent years and are likely to see in the next few years.² Our goal, then, is to foster competitive conditions that will lessen the need for legal intervention—including antitrust enforcement on the NII.

The regime that we select to protect intellectual property will significantly affect the need for antitrust regulation and the strength of competition on the NII. As we move online, care must be exercised to protect electronic intellectual property to—but not beyond—the extent necessary to promote the arts and sciences for the benefit of the public. This is not to suggest that intellectual property protection is unimportant. On the contrary, studies demonstrate that over the years, social returns from intellectual property protection have exceeded innovation returns that might have occurred without that protection. Clearly, we should not abolish patent and copyright protection. It is worthwhile, however, to contemplate whether the balance we have struck in the past makes sense in the context of emerging cyberspace technologies.

II. DETERMINING THE APPROPRIATE LEVEL OF PROTECTION FOR INTELLECTUAL PROPERTY IN CYBERSPACE

For guidance (maybe inspiration is a better word) we might return to the source of intellectual property protection in the United States—Article I of the Constitution—which grants Con-

1. For a discussion of international enforcement of antitrust laws, see Joel Klein & Preeta Bansal, *International Antitrust Enforcement in the Computer Industry*, 41 VILL. L. REV. 173 (1996).

2. See *The Interminablenet*, ECONOMIST, Feb. 3, 1996, at 70 (noting that internet activity is doubling every nine months).

gress the power “to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”³ Some would read this (perhaps at their peril) to suggest that the Founders did not view intellectual property as a natural “property” right of any kind. Rather, the public is the primary beneficiary of this provision; “ownership” is conferred upon creators only incidentally, as a by-product of the process of promoting progress. Taking this view, a cost/benefit analysis is required at every juncture. The degree to which protection stimulates a producer and so benefits the public must be weighed in each instance against the public detriment that necessarily flows from the market power conveyed by intellectual property interests.

There are many stakeholders, representing very diverse intellectual property interests, in cyberspace. Established content providers such as video and sound studios, broadcast producers and publishers, are concerned that the Net’s decentralized nature threatens their ability to control, and be compensated for, mass distribution. Individual artists worry that rapid technological change makes it impossible to foresee the impact of licensing provisions in the future. Some content providers devote enormous resources to copyright clearance activities, while online service providers fear that they will be held strictly liable for the infringement of subscribers who take their clearance obligations less seriously. Software publishers complain that even if copyright law protects them in the context of user-piracy (which they claim accounts for approximately one-half of their product distribution in a given year⁴), courts are increasingly unwilling to apply copyright sanctions to instances of the “competitor piracy” that takes the form of nonliteral copying. And as for creative users, even if they just want to have fun (as opposed to making money), it is not clear that the Fair Use Doctrine supports the kind of multi-media collage-making that the technology allows.

All of these interests—even those of the creative user—are legitimate and, at some point, conflicting. Reconciling these interests in the context of changing technology is a formidable task, but reconciled or not, these competing interests will directly affect the rate of progress and the vitality of competition in cyberspace. Content owners may be reluctant to develop and to release intellectual property into the electronic marketplace without assurances that

3. U.S. CONST. art. I, § 8, cl. 8.

4. *Piracy One of Many Software Issues*, CORP. LEGAL TIMES, June 1994, at 1.

they will receive a return on their research and development investment. Intellectual property clearance costs could remain prohibitively expensive. System Operators ("Sysops"), facing uncontrollable liability, might look for ways to limit the content available through their system by shutting down network access points. Well-heeled software developers may (and currently do) look increasingly to the patent system for protection which will, in turn, put the hero of the 1980s—the software developer in the garage—on the endangered species list (the continued existence of which is, itself, a matter of some debate in Washington these days). Any of these eventualities might erect barriers to new business entrants and raise costs, and any increase in intellectual property protections gained will have to be balanced against these types of social costs.

Intellectual property law and antitrust law are inextricably intertwined, sharing the common goal of "encouraging innovation, industry and competition."⁵ Inappropriate antitrust enforcement may interfere with an intellectual property owner's ability to reap the fruits of his or her invention, undermining not only intellectual property law, but also the goals of the antitrust laws themselves.⁶ By the same token, inappropriate or overbroad grants of intellectual property rights may interfere with the competition that often drives innovation,⁷ conflicting not only with the purposes of the antitrust laws, but also with the purposes of the intellectual property laws themselves. Likewise, overbroad protection of intellectual property poses a threat to competition. Intellectual property protection that goes beyond what is necessary to induce innovative effort may actually reduce innovation by other inventors who fear infringing on the broadly patented interests by raising their costs and restricting their activities and market access. Overbroad patent protection is especially troublesome because, in the patent context, independent creation is not a defense.⁸ Hence, if patent protection is granted to technology that represents nothing more than prior art,

5. *Atari Games Corp. v. Nintendo of America, Inc.*, 897 F.2d 1572, 1576 (Fed. Cir. 1990) (discussing patent and antitrust law as "complimentary" bodies of law).

6. This principle thoroughly conforms to the *Antitrust Guidelines for the Licensing of Intellectual Property*, recently issued by the Federal Trade Commission (FTC) and the Department of Justice. U.S. DEPARTMENT OF JUSTICE AND THE FEDERAL TRADE COMMISSION, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY (Apr. 6, 1995).

7. See MICHAEL E. PORTER, *THE COMPETITIVE ADVANTAGE OF NATIONS* (1990).

8. See 35 U.S.C. § 282 (1994) (listing defenses); see also *Hughes Tool Co. v. G.W. Murphy Indus., Inc.*, 491 F.2d 923, 927-28 (1973) (noting that independent development is not defense).

competition may be impeded and industry efficiency may be diminished without providing any corresponding incentive to innovate.

Initially, operating and development costs increase when competitors must structure their production around the protected property. In some industries, innovation tends to be discrete and directed at different goals.⁹ A competitor can work on the development of a new drug without worrying about infringing on patents given to other drugs. Software technology, however, tends to be cumulative and systematic, building on existing technology.¹⁰ Moreover, new software must be compatible with older systems and with the existing hardware base. Software innovators must, therefore, always be aware of the potential to infringe on existing intellectual property rights. If a patent has been inappropriately granted to prior art software, all would-be innovators in the field must either find alternate technical solutions, or secure a license to use the protected property. Moreover, network effects may sharply limit the market for even superior technology to the extent that it is incompatible with an installed base.¹¹ The tendency to adopt de facto standards means that a little bit of intellectual property protection goes a long way in a networked market.¹²

Additionally, uncertainty about what is and is not protected by a particular patent increases when the boundaries of the patentee's interest are ill-defined, and infringing liability is potentially expan-

9. See Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 902-04 (1990) (discussing chemical patents in pharmaceutical industry).

10. Richard R. Nelson, *Intellectual Property Protection for Cumulative Systems Technology*, 94 COLUM. L. REV. 2674, 2675 (1994) (noting that software packages are typically constructed using previously existing software programs and algorithms).

11. The historical pace of technological innovation in various industries characterized by cumulative technology supports the theory that broad blocking patents may retard innovation and industry growth. For example, the early years of the aircraft industry saw substantial patent litigation between the Wright brothers, who held a patent for a stabilizing and steering system for aircraft, and potential competitors who were unable to enter the industry without infringing on the patent. Merges & Nelson, *supra* note 9, at 890-91. The Secretary of the Navy finally worked out an automatic cross-licensing system for various manufacturers during World War I that enabled new competitors to enter the industry. *Id.* at 891. A similar blocking patent was held by the Marconi interests in the radio industry. After much litigation, the various manufacturers formed the Radio Corporation of America to acquire the major patents in return for ownership in the corporation. *Id.* at 893. Contrast these industries with semiconductors and computers, which developed without blocking patents. In the latter two industries, technological progress was rapid and less energy and resources were spent on litigation. *Id.* at 894.

12. See generally Klein & Bansal, *supra* note 1 (discussing various approaches to effective antitrust enforcement and their ramifications).

sive.¹³ Increased uncertainty concerning infringing activities may raise competitors' operating and developing costs. This increased uncertainty is common to all intellectual property protection

13. The Compton's New Media patent is a well-known example of how an inappropriate grant of protection points may harm. Fortunately, in this case, the Commissioner of the Patent and Trademark Office (PTO) invoked his powers under § 303 to re-examine the patent for prior art claims. Karl J. Kramer, *Computer Novelty: Can Software Be Patented?*, LEGAL TIMES, Jan. 24, 1994, at S33; see 35 U.S.C. § 303(a) (1994) (providing that "[o]n his own initiative, and at any time, the Commissioner may determine whether a substantial new question of patentability is raised by patents and publications discovered by him"). The PTO later rejected the patent. James Evans, *Patent Policies on Trial*, L.A. TIMES, July 27, 1994, at D4. Had this patent survived, the impact on future innovation in multimedia products would have been substantial. Other manufacturers of software for multimedia products would have faced reduced incentives to innovate, as certain key technology would have been foreclosed to them absent a license to the retrieval technology from Compton's.

The Compton's example underscores the necessity of granting protection only for true innovation, but it is not the only such example. A similar blocking patent has recently been challenged by firms that wish to compete with the patent holder. *Id.* For example, a small San Diego firm received a patent for a process that inserts advertising into software. *Id.* The firm is demanding royalties from any other software firm that wishes to incorporate advertising into its products. *Id.* Again, the Commissioner of the PTO has announced that this patent will be re-examined. *Id.* Moreover, measures undertaken by the PTO to avoid grants of overly-broad and obvious patents like Compton's have not proven effective to date. As recently as July 18, 1995, for example, the PTO issued a patent on a software-implemented method of teaching by superimposing a window containing the image of an instructor of the educational material on-screen. See Patent No. 5433614. According to the patentee, the "essence of the invention is the simultaneous display of the tutor's visage along with the material so as to create the sensation that the student is being individually tutored in a non-threatening, conversational manner." *Id.* The allowed claims appear to preclude unlicensed use of an on-screen "talking head" in any educational software. The Interactive Media Association reports that attorneys for the patentee have asked at least one interactive education and training products developer to pay a substantial licensing fee for each media type (e.g., CD-ROM, analog tape, laser disk, etc.) on which the technique appears, along with a semi-annual royalty payment. While the PTO may decide to re-examine this patent, the educational software industry will likely experience increased costs (in the form of attorney's fees and prior art searches) in the interim.

At an electronic multimedia trade show in 1993, Compton's New Media announced its then-recent receipt of a patent, applied for in 1989, that covered a database search system that retrieves multimedia information consisting of text, picture, audio and animated data. See Steven D. Glazer & Steven D. Kahn, *Patenting Software in the United States*, MANAGING INTELL. PROP., Feb. 1995, at 22. Compton's claimed that its patent covered many of the products being shown at the conference and demanded royalty payments. *Id.* Other manufacturers of multimedia products claimed that the patent covered database searches and retrievals that were in the prior art even in 1989, and therefore, should not be patentable. *Id.* Such prior art is difficult to find: "Much of the prior art that the agency needs to examine [in the Compton case], however, cannot be found in patents or scholarly publications, but is buried in the industry communications of software engineers and in computer code. Unfortunately, patent examiners are not equipped to search in the right places." Kramer, *supra*, at S33.

schemes, but is especially acute where the technology at issue is cumulative rather than discrete.¹⁴

Overbroad intellectual property law might make it harder to develop robust interoperability on the NII. Each component, such as computers, wires, switches, televisions and satellites, will be built by private concerns. Information must flow easily and accurately across these components if the NII is to reach its potential as a seamless web of networks and equipment. There is obviously a significant public interest in a highly interoperable infrastructure. First, each network's backbone of hardware and software that transports bundles of data has to communicate with any other local network in cyberspace. Second, transported content should be accessible for use in any number of applications. Some commentators have suggested that, under these circumstances, the transport backbone of the Net will develop as a natural monopoly. Although this is not a foregone conclusion, the Federal Trade Commission (FTC), along with a number of other Federal agencies, will undoubtedly be watching infrastructure development closely. The Clinton Administration has proposed a number of legislative incentives for the creation of "open access" networks for the Net.¹⁵

Finally, defensive measures to reduce uncertainty about the scope of a particular patent, such as purchasing licenses from the patentee to guarantee noninfringement or developing one's own portfolio of patents to use in cross-licensing arrangements, also may lead to increased costs. Litigation may result either from the desire of the patentee to protect its patents or from an innovator challenging those patents.¹⁶ All of these responses to the inappropriate patent grant reduce economic efficiency by increasing both overhead and production costs.

III. FUTURE OF INTELLECTUAL PROPERTY IN CYBERSPACE

Given the close connection between competition and intellectual property protection, it is worth stepping back and asking what is on the horizon for intellectual property protection in the infor-

14. In cumulative technology, the prior art in the public domain is more difficult to discover, a situation which is exacerbated here by the PTO's lack of an adequate prior art database for software. See Nelson, *supra* note 10, at 2676.

15. See, e.g., Telecommunications Reform Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) (promoting competition and reduction of regulation).

16. U.S. Patent and Trademark Office, *Hearings on Patent Protection for Software Related Inventions*, Jan. 26-27, 1994, at 17 [hereinafter *Software Patent Hearings*] (testimony of Douglas Brotz, Adobe Systems, Inc.) (concluding that "[a] 'patent litigation tax' is one impediment to our financial health that our industry can ill-afford").

mation industry. The issuance of the National Information Infrastructure Task Force's ("NIITF's") White Paper,¹⁷ coupled with the Patent and Trademark Office's recent issuance of examination guidelines¹⁸ that are expected to relax hurdles to receiving software patents, suggests that we are moving to increased intellectual property protections in the information industry. Before we adopt the policies reflected in these two documents, we should seriously consider whether increased intellectual property protection is necessary to ensure adequate appropriability in this field, and what the implications of this trend is for innovation and competition.

A. *NIITF's White Paper*

The software industry was born and raised in the absence of significant intellectual property protections.¹⁹ Until quite recently, we all assumed that patent protection was simply not available for software.²⁰ Intellectual property protection is derived largely from copyright and trade secret law. As courts gained experience with the software industry, they became increasingly willing to draw the idea/expression boundary at a point that facilitated interoperability and competition through imitation and emulation.

At first blush, the White Paper appears to endorse continued application of copyright law as currently interpreted by the courts. A closer reading, however, with attention to the sort of pre-packaged legislative history for the "modest" alterations it proposes, reveals a slightly different story. First, the White Paper's analysis of

17. INFORMATION INFRASTRUCTURE TASK FORCE, INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE: REPORT OF THE WORKING GROUP ON INTELLECTUAL PROPERTY RIGHTS, Sept. 1995, available at [gopher://ntiant1.ntia.doc.gov:70/00/papers/documents/files/iippi.txt](http://ntiant1.ntia.doc.gov:70/00/papers/documents/files/iippi.txt) [hereinafter WHITE PAPER].

18. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7478 (1996) [hereinafter PTO Guidelines].

19. See generally Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1026, 1135 (1990) (noting that most protection for computer software has developed under traditional copyright protections without aid of patent law).

20. See, e.g., *Parker v. Flook*, 437 U.S. 584, 594 (1978) (holding that only novel feature of alarm system was mathematical formula or algorithm, which was not patentable subject matter); *Gottschalk v. Benson*, 409 U.S. 63, 71-73 (1972) (holding that computer program not patentable process).

the Fair Use Doctrine²¹ threatens to severely circumscribe the availability of the fair use defense in the electronic age.²²

The White Paper implies that the purpose of fair use is to excuse copyright violations which occur only because reasonable licensing terms are unavailable or cumbersome to manage. In an age of instant, electronic licensing and digitized copyright information management systems, the report implies that the need for the fair use defense should recede substantially.²³ The White Paper does not consider how important social values other than appropriability, such as free speech, network interoperability and broad dispersion of innovation for educational and noncommercial exploitations, will be served in the absence of a robust fair use exception.

The White Paper also proposes, and implementing legislation has already been introduced in Congress,²⁴ to clarify that digital transmissions of copyrighted works constitute infringing distributions.²⁵ In fact, this seems to be the current judicial view on digital transmission.²⁶ Some commentators have speculated that a hidden agenda underlies the proposal, perhaps a desire to ensure that digital browsing without a license is viewed as copyright infringement.

21. The Fair Use Doctrine provides that "certain uses of a copyright protected work, which might otherwise be considered to be infringing, will be considered to be 'fair' and shall not result in infringement liability." RICHARD RAYSMAN ET AL., MULTIMEDIA LAW: FORMS & ANALYSIS § 5.08, at 5.28 (1995). What constitutes fair use "is a fact specific, case-by-case determination." *Id.* The doctrine is implicated "when a defendant claims that his or her use of the copyrighted work constitutes a fair use rather than an infringement." MICHAEL A. EPSTEIN, MODERN INTELLECTUAL PROPERTY § 4.02[c][1], at 4-40 (3d ed. 1995). The courts have enumerated four factors for determining what constitutes fair use: 1) "the purpose and character of the use; . . . 2) the nature of the copyrighted work; 3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and 4) the effect of the [defendant's] use on the potential market value of the copyrighted work." DSC Communications Corp. v. DGI Technologies, Inc., 898 F. Supp. 1183, 1188 (N.D. Tex. 1995). In 1976, the Fair Use Doctrine was codified in the U.S. Copyright Act. See 17 U.S.C. § 107 (1994) ("[T]he fair use of a copyrighted work . . . is not an infringement of copyright.").

22. WHITE PAPER, *supra* note 17.

23. *Id.* at 73-84.

24. See S. 1122, 104th Cong., 1st Sess. (1995) (providing greater copyright protection by amending criminal copyright infringement provisions); S. 1284, 104th Cong., 1st Sess. (1995) (applying copyright law to digital network environment of National Information Infrastructure).

25. See WHITE PAPER, *supra* note 17, at 165.

26. See, e.g., *Sega Enter. Ltd. v. MAPHIA*, 857 F. Supp. 1552, 1559 (N.D. Cal. 1994) (granting preliminary injunction and finding plaintiff likely to succeed in showing infringement); *Playboy Enter., Inc. v. Frena*, 839 F. Supp. 679, 689 (M.D. Fla. 1993) (holding that digitalized images transmitted by computer bulletin board service directly infringed copyright).

Finally, the White Paper proposes several legislative changes to criminalize the import, manufacture or distribution of devices or services "the primary purpose of which" is to circumvent copy protection technology,²⁷ overturning the Supreme Court's ruling in *Sony Corp. of America v. Universal Studios, Inc. (Sony Betamax)*²⁸ that held it impermissible to prevent the distribution of technology with a substantial non-infringing use.²⁹ The shift in emphasis may be subtle, but it dramatically alters the playing field by prohibiting distribution of technology that can be used both to infringe and to facilitate the exercise of fair use rights when one decides that the desire to infringe motivates such distribution.³⁰

B. PTO Guidelines

Moving on to the PTO Guidelines, three legal doctrines together protect against overbroad patent protection for software today: the subject matter test, the novelty test and the non-obviousness test.³¹ The Patent and Trademark Office (PTO) recently adopted new examination guidelines³² ("PTO Guidelines") governing internal decision-making on granting software patents by establishing presumptions that certain implementations of computer-based inventions constitute statutory subject matter.³³ The

27. WHITE PAPER, *supra* note 17, at 126.

28. 464 U.S. 417 (1984).

29. *Id.* at 421.

30. It is worth noting, although this is not part of my current examination, that the Copyright Management Information provisions of the proposed legislation would inevitably substantially undermine user privacy. WHITE PAPER, *supra* note 17, at 235.

31. See EPSTEIN, *supra* note 21, § 10.03.

32. PTO Guidelines, 61 Fed. Reg. 7478 (1996).

33. Until quite recently, it has been assumed that software was patentable only as an element of a traditionally patentable industrial processes, where patentees sought to foreclose use of algorithms *only* in conjunction with all steps in a claimed process. Samuelson, *supra* note 19, at 1096. Hence, the software patent debate has turned largely on subject matter questions, and on the attempt to distinguish preemptive claims on mathematical algorithms (which are not patentable) from innovative implementations of mathematical algorithms that do not pre-empt use of the algorithm itself (which are potentially patentable). *Id.*

The PTO Guidelines reduce the role of this initial distinction by instructing patent examiners to presume that (1) programmed computers are statutory "machines," (2) program encoded memory devices (such as floppy discs) are statutory "articles of manufacture" and (3) a sequence of steps implemented by code is a statutory "process," all potentially eligible for patent protection under § 101 of the Patent Act ("Act"). See 35 U.S.C. § 101 (1994). Using these presumptions, patent examiners are then instructed to review claims for adequate specificity under § 112 of the Act. See 35 U.S.C. § 112. Under the PTO Guidelines, operations performed at the direction of software may serve as "specific acts" that correspond to an invention claimed using "means plus function" language. PTO Guidelines, *supra* note

PTO Guidelines attempt to incorporate ambiguous recent Federal Circuit case law³⁴ into internal PTO decision-making on whether to grant software patents by establishing presumptions that computer implemented inventions constitute statutory subject matter.

These presumptions, in effect, ease the subject matter test, which, in turn, puts greater pressure on the novelty and nonobviousness test to weed out inappropriate patents. In an ideal world, it would be possible to determine with precision the novelty and non-obviousness of a software invention. In such a world, patent protection might turn out to be an appropriate way to protect intellectual property rights in software innovations.³⁵ Currently, however, the test for nonobviousness appears not to function well in the software

18, at 7483. If the Act's specificity requirements are met, examiners then determine whether a claimed invention meets the statutory requirements of novelty and nonobviousness. *Id.*

34. Until 1994, the Federal Circuit interpreted existing case law to hold that algorithms of the sort used in a general purpose digital computer are not patentable unless: (1) the application is limited to a specific special-purpose implementing apparatus or (2) the claim describes a series of steps for manipulating specific electronic signals. See, e.g., *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992) (holding that inventions directed solely to abstract mathematical formulae or equations are nonstatutory subject matter); *In re Iwahashi*, 888 F.2d 1370 (Fed. Cir. 1989) (holding fact that apparatus operates according to algorithm does not make it nonstatutory under 35 U.S.C. § 101 (1994)); *In re Grams*, 888 F.2d 835 (Fed. Cir. 1989) (holding process not statutory subject matter where all but one step was mathematical algorithm). While the Federal Circuit's 1994 decision in *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994), suggested that software may turn a general purpose computer into a special purpose computer, subsequent Federal Circuit decisions do not reflect consensus on this point. See, e.g., *In re Trovato*, 22 F.3d 290, 294-95 (Fed. Cir. 1994) (holding that where mathematical algorithm is implicit, it is nonstatutory subject matter); *In re Warmerdam*, 33 F.3d 1354, 1361 (Fed. Cir. 1994) (holding that patent covering "bubble hierarchy" was patentable); *In re Lowry*, 32 F.3d 1579, 1584-85 (Fed. Cir. 1994) (concluding data structure limitations were patentable); *In re Schrader*, 42 F.3d 1376, 1381-83 (Fed. Cir. 1994) (holding that mathematical algorithms described in patent preamble are not patentable).

35. Note, however, that the subject of software patents is a matter of substantial controversy within the computer industry and among practitioners and academics. See, e.g., *Software Patent Hearings*, *supra* note 16; Allen Newell, *Response: The Models Are Broken! The Models Are Broken!*, 47 U. PITT. L. REV. 1023, 1026 (1986) (arguing against patent protection of algorithms); Samuelson, *supra* note 19, at 1025-26 (same); Pamela Samuelson, et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2365 (1994) (proposing new form of legal protection to replace inadequate system); Richard H. Stern, *Solving the Algorithm Conundrum: After 1994 in the Federal Circuit Patent Law Needs a Radical Algorithmectomy*, 22 AIPLA Q.J. 167, 170 (Spring 1994) (arguing that algorithms "need and deserve intellectual property law protection"). *But cf.* Donald S. Chisum, *The Patentability of Algorithms*, 47 U. PITT. L. REV. 959, 960 (1986) (arguing that algorithms "should constitute subject matter eligible for patent protection"); Frederick R. Warren-Boulton, et al., *Economics of Intellectual Property Protection for Software: The Proper Role for Copyright*, 3 STANDARD REVIEW 1 (1995).

area.³⁶ Given continuing data and expertise problems, any expansion of the scope of statutory subject matter will inevitably result in the issuance of more patents that do not meet the statutory requirements of novelty and nonobviousness, but instead have the potential to block further software development. Given the non-public nature of the patent application process, the absence of effective post-award review and the substantial transaction costs associated with defending patent infringement litigation, many improvidently granted patents are likely to go unchallenged.

The PTO Guidelines also appear to increase liability for "innocent infringement." Under current PTO practice, where software is patentable only as a process, third-party software distributors including retail software vendors, online service providers and hardware retailers (so called "innocent infringers") are not directly liable for patent infringement because they do not make, use or sell

36. The statutory requirement that a patent be nonobvious posits a gap between current technology and the innovation. The Supreme Court has enunciated a three part test for nonobviousness: (1) the level of ordinary skill in the art and the scope of the prior art must be determined; (2) the differences between the prior art and the patent claims at issue must be ascertained; and (3) the obviousness of those differences to a person of ordinary skill must be decided. *Graham v. John Deere Corp.*, 383 U.S. 1, 17-18 (1966). Software innovation, however, typically does not have such a gap. See Newell, *supra* note 35, at 1026 (concluding that there is no gap in computer science); Samuelson, *supra* note 19, at 1110. Software innovations are based on existing technology and tend to be marginal, systematic and predictable.

The nonobviousness test further implies consensus as to who qualifies as a "person of ordinary skill in the art," per the third requirement listed above. In fact, there are few clear lines in the software industry, and programming encompasses a very broad range of skills. The nonobviousness test is further complicated by the fact that software patents often claim business or educational methods which need to be evaluated with respect to the state of the art in those fields as well.

It can be difficult for examiners even to determine the state of the prior art for any new software application. See Kramer, *supra* note 13, at S33. Because the software industry largely grew without patent protection, many of the basic building blocks of the current state of the art have been in prior use for years, although not in a manner susceptible to discovery by PTO examiners. The prior art is buried in computer code rather than published, and that which was developed and used in the 1970s and 1980s, and which has been subsumed into current codes, no longer exists. *Id.* The lack of an adequate prior art database and an inadequate patent classification system in the computer software area makes it difficult for the PTO to develop sufficient expertise in the granting of software patents. The Commissioner of the PTO has admitted that:

[in] improving quality of examination for our software-related inventions . . . there are some inherent problems which are very difficult to address . . . [including] that a lot of what is known in this area is in the area of trade secrecy. It's not written down anyplace. It's not even in prior patent applications, and so we have a very difficult time sometimes making determinations.

Software Patent Hearings, *supra* note 16, at 2.

the patented process. They can be held liable by patentees only if they are shown to have "culpable knowledge" of the infringement. Because the PTO Guidelines will provide patent protection for encoded floppy discs,³⁷ third-party software and hardware distributors will become strictly liable for direct infringement. This reverses liability allocations deliberately established by Congress in 1952.³⁸ As a result, software distributors will face greater risks of infringing on protected property, and the higher compliance and litigation costs associated with these greater risks.

IV. CONCLUSION

The risk of granting overbroad intellectual property protection might conceivably be acceptable if the alternative was a stagnant software industry. That does not seem to be a likely outcome, however, of retaining, at least for the present, the status quo on intellectual property protection for software. The current mix of patent and copyright protection available for software is recent, but appears to have been successful in encouraging substantial innovation. Instead, the software industry is large and rapidly growing,³⁹ and U.S. software companies hold substantial technological and market advantages over foreign competitors.⁴⁰ It is unclear from the available evidence that any market failure has occurred, or that expanded patent protection is necessary to cure such failure. Additional protection, therefore, may be unnecessary or perhaps even counterproductive.⁴¹ Inappropriate or defective grants of patents to protect software innovation may contain serious risks of overpro-

37. Under the PTO Guidelines, encoded memory devices such as floppy discs are presumed to constitute statutory "articles of manufacture." PTO Guidelines, *supra* note 18, at 44.

38. 35 U.S.C. § 271 (1994); *see* Aro Mfg. Co. v. Convertible Top Co., 377 U.S. 422, 525-27 (1963) (Black, J., dissenting) (discussing legislative history of § 271 of Patent Act).

39. A spokesman for Intellectual Property Owners, Inc. stated that, in 1992, sales for controlling software for non-computer uses "by many estimates well-exceeds one hundred billion dollars a year," while sales of packaged software for computers adds another 17 billion dollars a year to that total. *Software Patent Hearings, supra* note 16, at 6 (testimony of William Ryan, Intellectual Property Owners, Inc.).

40. "The US software industry . . . is the fastest growing industry in this country by any rational measurement. . . . The growth has been fueled by strong export performance by US companies; 75% of the world's sales of pre-packaged software comes from US software companies." *Software Patent Hearings, supra* note 16, at 66 (testimony of William Neukom, Vice President, Microsoft Corporation).

41. *See* Nelson, *supra* note 10, at 2675 (noting that over-protection will discourage production and creativity).

protecting software to the detriment of competition, consumers and current and future software innovators.