

“Peer to Patent”:

Collective Intelligence, Open Review and Patent Reform

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INTRODUCTION	4
PART II: THE PARADE OF HORRIBLES; INFORMATION DEFICIT AND PATENT QUALITY	17
PART III: WHY TRADITIONAL PEER REVIEW IS NOT THE SOLUTION.....	34
PART IV: "PEER TO PATENT": THE OPEN REVIEW ALTERNATIVE	44
PART V: WHY OPEN REVIEW	58
CONCLUSION: INSTITUTIONAL COMPETENCE AND PATENT REFORM	81

ABSTRACT

While the first patent examiner, Thomas Jefferson, consulted Joseph Hutchinson, Professor of Chemistry on March 12, 1791 to seek his advice in connection with a patent on an alchemical process, modern patent examiners labor independently under a backlog of 1 million applications with no more than 18-20 hours to decide on the 20 year grant of monopoly rights. The patentability determination, as much if not more so than any regulatory rulemaking, depends upon knowledge of science. Yet examiners lack the requisite information to examine patents adequately. The Patent Office's predominance as a repository of scientific information has waned. Examiners must rely on incomplete databases and are prohibited from consulting outside sources, often including the Internet. Still over 90% of applications are granted.

The Patent Office is the paradigmatic example of the challenge facing regulatory agencies: how to make complex decisions without the benefit of adequate information. This paper argues that the distrust of scientific experts produces an information deficit that results in poor quality patents.

The Article puts forward a solution: "open review" to combine the wisdom of expert scientific communities of practice with the legal determinations of a trained Patent Office staff. Open review aims to improve the quality of issued patents by giving the patent examiner access to better information by means of an open peer review process. The Community Patent Review project, a policy initiative that has grown out of this Article, will create a web-based system that exploits network technology to connect innovation experts to patent examiners and the patent examination process. Adopted by the United States Patent and Trademark Office and slated for implementation in Spring 2007, Community Patent Review is the first social software project to be directly connected to the legal decision-making process.

Unlike ordinary peer review, which is closed and therefore subject to manipulation, open review adopts a broader vision of collaborative expertise. It is both more expert and more participatory. Unlike other proposals for *ex post* patent reform, open review addresses the core problem of information deficit that cannot be solved by the courts. It requires no statutory change to try and minimal to implement.

We have arrived at a unique moment in history when four factors converge to make this possible: first, the state of patenting meets with almost universal opprobrium; second, patent applications are published after eighteen months independent of grant, making it possible to consider open review; third, we now have the technology to make this possible at scale; and fourth, we have experience both with peer review and with online systems for collaborative decision making that provide the understanding of how to reconstruct our institutions. At this juncture when patent reform is uncertain to move either through Congress or the US Supreme Court, focusing our attention on the role of scientific expertise in Patent Office practice may be our best opportunity to bring about much-needed reform in ways that are data-driven and empirically measurable.

This idea for an open and collaborative model of governance applies to the reform of patents as well as to remedy the information deficit at other agencies. It may enable us to contribute to the design of social systems that depend upon the collaboration of experts across a distance, providing ways to improve policymaking, deepen democracy and rethink our fundamental assumptions about governance.

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Introduction

There is a crisis of patent quality. Vague, overbroad patents lacking in novelty that fail the constitutional mandate of "promoting the progress of science and the useful arts"² are being issued. The grant of a high volume of patents (over 350,000 a year) at a staggering rate (upwards of 90% of patent applications are granted) produces increasing uncertainty about their merit. Low quality patents generate litigation and confer the economic rewards of monopoly with little benefit to the public.³ In a recent empirical study, "Determinants of Patent Quality: An Empirical Analysis"⁴ Columbia Public Health Professor Bhaven Sampat analyzes the dataset of prior art references from 502,687 utility patents

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² U.S. Const. art. I, § 8.

³ ADAM B. JAFFE AND JOSH LERNER, INNOVATION AND ITS DISCONTENTS, 2 (2004) ("Thus, the patent system - intended to foster and protect innovation - is generating waste and uncertainty that hinders and threatens the innovative process."). See also A PATENT SYSTEM FOR THE 21ST CENTURY 70 (Stephen A. Merrill, Richard C. Levin, and Mark B. Myers, eds., 2004). See also, Shubha Ghosh & Jay Kesan, What Do Patents Purchase? In Search of Optimal Ignorance in the Patent Office, 40 HOUS. L. REV. 1219, 1227-36 (2004); Mark A. Lemley, Rational Ignorance at the Patent Office, 95 NW. U. L. REV. 1495, 1496 (2001); Editorial: *The Problem with Patents*, WALL ST. J., March 29, 2006, at 18.

⁴ Bhaven Sampat, Determinants of Patent Quality: An Empirical Analysis (2006) (unpublished article manuscript available at http://siepr.stanford.edu/programs/SST_Seminars/patentquality_new.pdf_1.pdf).

issued between January 1, 2001 and December 31, 2003. He finds that "patent examiners have a comparative disadvantage [relative to applicants] in searching for non-patent prior art and foreign patents, suggesting that all else equal [sic], patents are likely to be of lower quality for technological areas for which most prior art is not embodied in U.S. patents."⁵ Patent examiners are currently trying to make decisions that will shape an industry about a twenty-year⁶ grant of monopoly rights on the basis of information contained only in the USPTO's internal databases.⁷ Examiners may not consult the public nor may they talk to experts or, in most cases, even use Google. The information upon which examiners may rely in making a determination is further limited by poor or ambiguous drafting by applicants and the fact that there is no onus upon those applying for a patent to supply adequate information to the examiner. The costs of searching fall to the Patent Office alone.⁸

As James Rumsey remarked in a letter to Thomas Jefferson in 1789, the issuance of patents is "more within the information of a board of academical professors, and a previous refusal of a patent would better guard our citizens

⁵ Bhaven Sampat, *Determinants of Patent Quality: An Empirical Analysis 3* (2006) (unpublished article manuscript available at http://siepr.stanford.edu/programs/SST_Seminars/patentquality_new.pdf_1.pdf).

⁶ Patent Act, 35 USC §154(a)(2) (2004) ("Subject to the payment of fees under this title, such grant shall be for a term beginning on the date on which the patent issues and ending 20 years from the date on which the application for the patent was filed in the United States...").

⁷ U.S.P.T.O., PARTS, FORM, AND CONTENT OF APPLICATION, MANUAL OF PATENT EXAMINING PROCEDURES (MPEP) § 902.03(e) (8th ed. 2004) ("The automated search tools on examiners' desktop computers include the Examiner's Automated Search Tool (EAST), the Web-Based Examiner Search Tool (WEST), and the Foreign Patent Access System (FPAS).")

⁸ Lee Petherbridge, *Positive Examination*, 46 IDEA 173 (2006) (arguing that we must reduce the information costs of searching imposed upon the Patent Office).

against harassments by lawsuits."⁹ Yet today's patent system replaces expert "academical" input with the centralized and isolated expert-bureaucrat evaluating applications on the basis of a legal fiction, namely from the viewpoint of the "Person Having Ordinary Skill in the Art" (PHOSITA) in whose shoes he is expected to stand.¹⁰

The Patent Office is the paradigmatic example of the challenge facing regulatory agencies: how to make complex decisions without the benefit of adequate information. The solution proposed, Community Patent Review, aims to improve the quality of issued patents by giving the patent examiner access to better information by means of an open network for community peer review of patent applications. Community Patent Review will create a web-based system that exploits network technology to connect innovation experts to patent examiners and the patent examination process. Adopted by the United States Patent and Trademark Office and slated for implementation in Spring 2007, Community Patent Review is the first social software project to be directly connected to and have an impact on the legal decision-making process. This idea for an open and collaborative model of governance applies to the reform of

⁹ E.C. Walterscheid, *Thomas Jefferson and the Patent Act of 1793*, in 40 ESSAYS IN HISTORY (1998) (quoting Letter, James Rumsey to Thomas Jefferson, dated June 6, 1789, in THE PAPERS OF THOMAS JEFFERSON, Julian P. Boyd et al., Princeton: Princeton University Press, 1950 at 15:171-2).

¹⁰ Patent Act, 35 U.S.C. § 103 (2004). See also Rebecca Eisenberg, *Ideas Into Action: Implementing Reform of the Patent System: Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERK. TECH. L.J. 885, 886 (2004) ("[T]his language seems to call for evaluations of non-obviousness from the perspective of ordinary practitioners who are contemporaries of the inventor in the relevant technological community. It specifies a point in time as of which the obviousness of the invention should be evaluated ('at the time the invention was made') and designates the person whose judgment of obviousness should control ('to a person having ordinary skill in the art to which said subject matter pertains' or PHOSITA), as well as directing attention to 'the differences between the subject matter sought to be patented and the prior art.'")

patents as well as to remedy the information deficit at other agencies. Hence the normative analysis should be of interest to intellectual property and administrative law scholars and practitioners alike.

While the first patent examiner, Thomas Jefferson, consulted Joseph Hutchinson, Professor of Chemistry at the University of Pennsylvania, on March 12, 1791 to seek his advice in connection with a patent on an alchemical process,¹¹ today 4,000 underpaid¹² and overwhelmed¹³ patent examiners¹⁴ labor

¹¹ LEONARD WHITE, *THE FEDERALISTS: A STUDY IN ADMINISTRATIVE HISTORY* 137 (1948) (quoting letter from Thomas Jefferson, dated 12 March 1791 *reprinted in* THE THOMAS JEFFERSON PAPERS 1606-1827 at the Library of Congress, available at http://memory.loc.gov/ammem/collections/jefferson_papers/index.html).

¹² A patent examiner gets paid less than half the salary of a first-year associate prosecuting patents for a large law firm. According to the United States Patent and Trademark Office, a patent examiner starts at levels between GS-5 to GS-9, where the salary is between \$35,548 and \$49,729. GS-13 earns \$78,018. *See* <http://www.usptocareers.gov/home.asp> (follow "FAQ" for the list of grades; and follow "Job Search" for salaries at grade level). Entry level salaries for first year associates in large New York law firms are around \$145,000. Ellen Rosen, *For New Lawyers the Going Rate has Gone Up*, THE NEW YORK TIMES, Sep. 1, 2006, available at <http://www.nytimes.com/2006/09/01/business/01legal.html?ei=5070&en=1f34472c9706a898&ex=1158033600&adxnnl=1&emc=eta1&adxnnlx=1157387004-Z0cf/A4Bj5KUE6a3wPGGmg>; see also NALP: The Association for Legal Career Professionals, *Salaries and Compensation: Private Sector*, at <http://www.nalp.org/content/index.php?pid=147>.

¹³ America has twice the number of applications with the same number of examiners as the European Patent Office. *See* ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDURING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT* 11-18, 131 (2004).

¹⁴ There are currently 4,000+ patent examiners with plans to increase that number to 7,200 in order to address the backlog. *See* U.S.P.T.O. Draft Strategic Plan 2007-2012, 71 Fed. Reg. 50048 (2006) (In FY 2006, the USPTO plans to hire 1,200 patent professionals, and in years FY 2007 – FY 2012, we plan to hire at least 1,000 a year, for a total of at least 7,200 patent examiner hires in 7 years. This level of hiring is a critical component of the plans to address patent pendency regardless of the time frame for such improvements. Notwithstanding these massive hiring efforts, in the absence of other changes to the current examination system only modest gains in reducing patent pendency are likely to be achieved in the near term. In fact, until these new hires are effectively absorbed into the examination system, average patent pendency will continue to increase.).

independently under a backlog approaching 1 million applications¹⁵ with no more than 18-20 hours¹⁶ to review each one. With increasing automation and the reduced opportunity to meet in the library, examiners communicate less with each other rather than more. Examiners lack the requisite information to examine patents adequately: there is either too little information about prior inventions on file – as in the case of computer software patents – or too much information – as in the case of biotechnology – without the means to sort it. There is no continuing science education¹⁷ at the USPTO and no dialogue with the scientific community.

¹⁵ At the end of 2005, the number of pending patent applications was 885,002 and rising. See U.S.P.T.O. Draft Strategic Plan 2007-2012, 71 Fed. Reg. 50048 (2006), available at <http://www.uspto.gov/web/offices/com/strat2007/index.htm>; U.S.P.T.O. Performance and Accountability Report Fiscal Year 2005: Other Accompanying Information: Table 3: Patent Applications Pending Prior To Allowance, available at http://www.uspto.gov/web/offices/com/annual/2005/060403_table3.html. See also *USPTO Oversight Hearing, Before The Subcommittee on Courts, The Internet, and Intellectual Property Committee On The Judiciary United States House of Representatives* (2005) (The Honorable Jon W. Dudas, Under Secretary Of Commerce for Intellectual Property and Director Of The United States Patent and Trademark Office) at <http://judiciary.house.gov/media/pdfs/dudas090805.pdf> ("without any change to the system, the backlog of applications awaiting a first review by an examiner is expected to grow from the current level of approximately 600,000 to over 1,000,000 by 2010.") (last visited Sept. 30, 2005).

¹⁶ Kevin Maney, *Examiners Can't Keep Up With Patent Applications*, USA TODAY, June 15, 2005, at http://www.usatoday.com/tech/columnist/kevinmaney/2005-09-20-patent-office_xhtml (quoting John Doll, Commissioner for Patents, USPTO). U.S. GEN. ACCOUNTING OFFICE, H.R. REP. NO. GAO-05-720, THE USPTO HAS MADE PROGRESS IN HIRING EXAMINERS, BUT CHALLENGES TO RETENTION REMAIN (2005) (depending on the type of patent and the skill level of the examiner, each examiner is expected to process an average of 87 applications per year at a rate of 19 hours per application). See also, Brenda Sandburg, *Speed Over Substance?*, INTELL. PROP. MAGAZINE (March 1999).

¹⁷ Required to become a patent examiner is required "a degree from an accredited college or university in Electrical Engineering, Computer Engineering, Computer Science, Mechanical Engineering, Chemical Engineering, Material Science Engineering, Biology and Organic Chemistry." No advanced degree is required. See <http://www.usptocareers.gov/home.asp> (follow "FAQ") (last visited Sept. 30, 2005).

This paper argues that abjuring input from and accountability¹⁸ to outside scientific experts produces problems at the Patent Office with information quality and information transparency. The central insight is that the distrust of outside expertise produces an information deficit that results in poor quality patents. The reluctance to use outside science translates into undue reliance on centralized structures of expertise and decision-making. The distrust of outside expertise is magnified by the concomitant difficulty with engaging experts effectively and efficiently, compounding the informational deficit and turning the patent quality problem into a problem of information access.¹⁹

The dearth of information, as this Article argues, cannot be solved through judicial review. The Federal Circuit, the specialty patent appeals court, rules in favor of patent holders²⁰ more often than not and awards large financial

¹⁸ Temina Madon, *Congress 101: Teaching Scientists The Language Of Policymakers*, 6 BERK. SCI. REV. 43, 44 (Spring 2006) ("Many scientists drawn into the world of policy share a sense that greater numbers of researchers should be involved in the decision-making process. Bruce Alberts, a biochemistry professor at UC San Francisco and former President of the National Academies, has been a strong advocate for the role of science in policy. During his tenure at the Academies he helped establish fellowship programs that bring scientists and engineers to Capitol Hill, with the goal of influencing lawmakers and convincing them to embrace evidence-based approaches in their work.").

¹⁹ For another perspective on the information problem of patents, see Lee Petherbridge, *Positive Examination*, 46 IDEA 173 (2006) (focusing on the information costs associated with defining the boundaries of a patent and arguing that the failure on the part of the Patent Office to collect sufficient information from applicant is interfering with the ability to efficiently and reproducibly construct a consistent understanding of the boundaries of the patented property. "So viewed, transactions involving questionable patents, and indeed transactions involving all patents, can be productively considered as problems of information costs and information cost allocation."). See also see Clarisa Long, *Information Costs in Patent and Copyright*, 90 VA. L. REV. 465 (2004).

²⁰ "Judges appointed after 1982 voted to hold a patent valid 164 times out of 298, or 55.0% of the time. While judges appointed to the Federal Circuit, with its widely asserted pro-patent orientation, did vote slightly more often to uphold the validity of a patent than their predecessors, the numbers are quite similar. The Federal Circuit did hold patents valid much more often than its predecessor courts, but the difference cannot be attributed to judges appointed to that court at different times." Mark Lemley & John R. Allison, *How Federal Circuit Judges Vote in Patent Validity Cases*, 27 FLA. ST. U. L. REV. 745 (2000). See also Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized*

judgments for patent enforcement, spawning a new industry of predatory "patent trolls," patenting for litigation not innovation.²¹ Yet contrary to the prevailing theory, "Daubert-izing"²² agency decision-making and changing the current standard of judicial review (or rather lowering the high degree of deference and lack of review) of Patent Office decisions is too slow, too intermittent and too late in the game to solve the problem. Judicial review comes too late in the process to remedy the informational deficit, especially as judicial review has to await first a 2-5 year review process at the Patent Office itself.²³

Other reform proposals that call for *ex post* solutions, such as post-grant administrative review to "gold-plate" important patents, as Lemley, Lichtman and Sampat propose²⁴ (and the Patent Reform Act of 2005²⁵) still require

Courts, 64 N.Y.U. L. REV. 1 (1989); Donald R. Dunner, *The United States Court of Appeals for the Federal Circuit: Its First Three Years*, 13 AIPLA Q.J. 185 (1985); As Professors Dan L. Burk and Mark Lemley remark, "the Federal Circuit has bent over backwards to find biotechnological inventions nonobvious, even if the prior art demonstrates a clear plan for producing the invention." Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERK. TECH. L.J. 1155, 1156 (2002).

²¹ William M. Bulkeley, *Aggressive Patent Litigants Pose Growing Threat to Big Business*, WALL ST. J., September 14, 2005, at A1 (discussion of impact of patent trolls on successful businesses). See, e.g., Martin LaMonica, *Small Company Makes Big Claims On XML Patents*, CNET (October 21, 2005) (small company seeking to extract licensing royalties from users of open standard XML), at http://news.com.com/Small+company+makes+big+claims+on+XML+patents/2100-1014_3-5905949.html?part=rss&tag=5905949&subj=news. This is one of myriad such cases of someone patenting an already known and fundamental technology and then seeking to extort royalties using a patent that should never have been granted.

²² *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993). See Alan Charles Raul and Julie Zampa Dwyer, *Science in the Regulatory Process*, 66 L. & CONTEMP. PROB. 7 (2003).

²³ Joseph Farrell and Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*. 19 BERK. TECH. L. J., 1 (2004).

²⁴ Mark A. Lemley, Douglas Lichtman and Bhaven Sampat, *What to Do about Bad Patents?*, 28 REGULATION 10-13 (2005-6) (arguing for post-grant opposition, "a process by which parties other than the applicant would have the opportunity to request and fund a thorough examination of a recently issued patent.").

improved mechanisms for getting at the information necessary to make the patentability determination. Even proposals to change the statutory standards of patent examination and revisit the scope of patentable subject matter or the definition of obviousness do not obviate the need to address the grave problem of information deficit. Even where there have been proposals to require applicants to perform more thorough searches, the applicant may lack the incentive and the knowledge to find all the relevant information.

What if we could reform patenting *ex ante* and ensure better applications before the cost of litigation? What if we could make it easier to ensure that only the most worthwhile inventions got twenty years of monopoly rights? What if we could offer a way to protect the inventor's investment while still safeguarding the marketplace of ideas from bad patents? What if we could give the scientific community a voice in determining whether an invention was truly novel or obvious? What if we could make informed decisions about the scientifically complex issues posed by patent law before the fact?

This Article puts forward a normative proposal for a new reform model that might revolutionize the process of patent examination. It is a necessary precursor to all other patent reform proposals because it goes to this central question of the use of scientific information. This proposal for what we shall term "open review" or "open examination" separates scientific from legal decision-making and distributes the former to an external expert community by means of an online network. The scientific community provides informational input about what it knows best. Most important, those contributions are directly

²⁵ Patent Reform Act of 2005, H.R.2795, 109th Cong. (2005) (Introduced in House June 8, 2005).

ties to the ultimate legal determination. The patent examiner with her deep knowledge of the legal standards of patentability remains the ultimate arbiter and provides feedback to the community. Creating this network of scientific expertise, by means of new technology, would not eliminate the agency official nor would it shield the scientific expert from political decision-making. This has the potential to remedy the information deficit and improve patent quality.

We have arrived at a unique moment in history when five factors converge to make this kind of reform proposal possible: first, the state of patenting has become so problematic as to meet with almost universal opprobrium; second patent applications are published after eighteen months independent of grant, making it possible to consider open peer review;²⁶ third, peer review is widely practiced in the public sector (e.g. EPA, NIH, NSF); fourth, we have the social reputation and social networking technology to make open review on this scale possible; and, fifth, we have the expertise with such endeavors as Wikipedia, Slashdot, Yahoo Answers, Linux, Apache and many more such collaborative decision-making systems, both online and off, to be able to design and construct a new legal institution.

Open examination has the advantage of being both more expert and more participatory while avoiding the lack of transparency that plagues traditional peer review. With open examination, we can improve patent quality by opening up review to the scientific community to remedy the information deficit and, at

²⁶ The Patent Reform Act of 2005, H.R.2795, 109th Cong. (2005) would make publication of patents universal. Under the current rule publication is the default but applicants may request an opt out by certifying that the invention disclosed in the application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing.

the same time, make that review accountable to scientific experts. This proposal has far-reaching implications for the ways we might use scientific expertise in policymaking across administrative agencies.

By redesigning the model for patent examination, this proposal points the way forward toward a new approach for administrative law, not by "Daubertizing" judicial review nor by reforming statutory standards²⁷ but by improving agency institutional practice. Introducing technology to bring about open review, instead of peer review, might enhance the institutional competence of the Patent Office itself. At this juncture when patent reform is uncertain to move either through Congress²⁸ or the US Supreme Court,²⁹ changing the administrative practices of the agency responsible for implementing patent law

²⁷ Current reform proposals include altering the definition of patentable subject matter, changing the definition of obviousness, abolishing the concept of constructive reduction to practice, narrowing the scope of willful infringement, changing the standards of judicial review and the presumption of patent validity and curtailing the availability of injunctions. Matthew Sag and Kurt Rohde, *A Differential Impact Analysis of Patent Reform*, Section B2 "Doctrinal Reform," Aug 12, 2006, (unpublished manuscript available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers2/sag.doc>) (discussing substantive statutory reform proposals). See also Jay Dratler, *Invention is a Process, or Why the Electronics and Pharmaceutical Industries are at Loggerheads over Patents*, Aug. 12, 2006, unpublished manuscript, available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers/Dratler.doc> (calling for abolition of constructive reduction to practice and changing the non-obviousness standard).

²⁸ Recent proposed but as yet not enacted legislative proposals include: The Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005); The Patents Depend on Quality Act, H.R. 5096, 109th Cong. (2006); The Patent Litigation Pilot, H.R. 5418, 109th Cong. (2006). Patent lawyer, academic and blogger, Prof. Dennis Crouch writes: "Substantive patent reform legislation is dead for the year." Patently-O Weblog, http://www.patentlyo.com/patent/2006/07/patent_reform_i.html (July 28, 2006).

²⁹ *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 2004 U.S. App. LEXIS 11248 (Fed. Cir., 2004), *cert. denied*, 126 S. Ct. 2976 (June 30, 2006) (dismissing writ of certiorari as improvidently granted). While the Supreme Court has heard other patent-related cases this year,, the much-anticipated case reviewing the substantive scope of patentability was not heard.

may be our best opportunity, not only to bring about reform, but also to do so in ways that are data-driven and empirically measurable.

The United States Patent Office announced in its strategic plan (2007-2012) that it will pilot this proposal (on the basis of an earlier draft of this Article) and institute its use for a controlled set of patents to be examined beginning in 2007.³⁰ Companies, including IBM, Microsoft, Oracle, Intel, Hewlett-Packard, and Red Hat have agreed to submit their patents for examination under this open system.

Like the work of Arti Rai and Stuart Benjamin, this Article contends that focusing on patent examination as administrative practice is normatively desirable. It shifts our focus to the institutional competence of the agency and highlights new opportunities for patent reform.³¹ Our administrative structures have been constructed around certain beliefs, namely that centralized administrators have the best access to information, that expert bureaucrats are the only way to produce dispassionate decisions and that making decisions in the public interest requires keeping the public at bay. As Robert Reich has pointed out, agency decision-making, by separating legal decision-making from

³⁰ See U.S.P.T.O. Draft Strategic Plan 2007-2012, 71 Fed. Reg. 50048 (2006), available at <http://www.uspto.gov/web/offices/com/strat2007/index.htm> (discussing patent application peer review pilot).

³¹ Stuart Minor Benjamin and Arti K Rai, *Who's Afraid of the APA? What the Patent System can Learn from Administrative Law*, 95 GEORGETOWN L. J. ____ (2006). Also available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=897307. See also, Kristen Osenga, *Entrance Ramps, Tolls, and Express Lanes – Proposals for Decreasing Traffic Congestion in the Patent Office*, 33 Fl. St. U. L. Rev. 119 (2005) (proposing multi-tiered patent application and examination system); Joseph Farrell and Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 BERK. TECH. L. J. (2004) (arguing that judicial review cannot fix the patent problem alone and urging better USPTO funding and higher standards of initial review, better incentives (not limited to formal duties) for applicants to find and disclose prior art information, and the creation of a cheap and workable administrative post-issue review.).

scientific expertise, "confounds the ideal of scientific policy-making on which the legitimacy of regulatory agencies is based."³² We build legal institutions around insular bureaucratic expertise that is premised upon a bygone material reality, namely that the agency possesses the best information. We continue to trust in bureaucratic experience that does not work, instead of in the collective intelligence that the Net now makes possible.³³

This Article lays out the argument about information deficit and outlines a detailed draft blueprint for the Community Patent system. The next Part discusses the current state of patent law and examination in the United States and the problems to which it gives rise. We demonstrate how the distrust of science in the patent examination process is producing an information deficit that hampers effective patent review. Part II argues that the patent crisis – whether the problem of patent quality or simply the lack of efficiency in the process – is directly caused, not by faulty standards but by the lack of information in the examination process.

In Part III, we discuss why traditional peer review is not a solution to the informational deficit because it lacks transparency, has a closed vision of expertise and places undue burdens on scientists and agency officials alike. As traditionally practiced, it also comes too late in the game to be useful to remedy the information deficit that impedes quality decision-making.

³² DAVID SCHOENBROD, *POWER WITHOUT RESPONSIBILITY* 100 (Yale University Press 1993) (citing Robert B. Reich, Book Review of *The Politics of Regulation*, NEW REPUBLIC, June 14, 1980, at 36-37.).

³³ Yochai Benkler, *Coase's Penguin, or, Linux and The Nature of the Firm*, 112 YALE L. J. 369 (2002). See also *The Digital Universe*, available at <http://www.digitaluniverse.net/> (offering collaborative web portals to foster expertise).

Part IV of this paper lays out the proposal for open peer review and argues for opening up patent examination, not to input from authenticated experts, but to the community that collectively is likely to have the knowledge and experience required to inform decision-making. Open review combines the transparency and self-selection of public participation with the information criticality and expertise of peer review. Metaphorically speaking, it marries the practices of *Wikipedia* to the authority of administrative law.³⁴ This section explains how open review addresses the problems that have been encountered not only with public consultation but also with peer review as it has traditionally been practiced. It provides a description of the design for community review and responds to critiques and questions about this new system.

Finally, we conclude in Part V with a section explaining the advantages of open review and anticipating objections. We then conclude with a discussion on institutional competence, putting forth the claim that by applying technology to improve the patent examination process itself, we are, in fact, able to bring about law reform faster and more effectively than traditional strategies that regard Congress and the courts as the only institutional mechanisms for reform. Where Congress has failed to pass reform legislation and the Supreme Court has declined to review the scope of patentable subject matter, Community Patent Review is being adopted in practice. Patent examination is urgently in need of improvement to remedy the informational deficit that gives rise to low quality

³⁴ Nicholas Varchaver, *Patent Review Goes Wiki*, FORTUNE MAGAZINE, Aug. 21, 2006, at 18, available at http://money.cnn.com/magazines/fortune/fortune_archive/2006/08/21/8383639/index.htm?source=yahoo_quote.

patents. Open review offers the structure by which to tie public participation to governmental decision-making in ways that are manageable and useful. At the same time, the empirical lessons to be learned from reforming the institution of the United States Patent and Trademark Office promise to redound to the benefit, not only of intellectual property law and policy, but of administrative rulemaking more broadly.

Part II: The Parade of Horribles; Information Deficit and Patent Quality

Abraham Lincoln said that the "patent system added the fuel of interest to the fire of genius."³⁵ It is the sole specific grant of power by the Constitution directing Congress to award authors and inventors a private property right in new inventions that "promote the progress of science and the useful arts."³⁶ This was an inexpensive way for the new and impoverished federal government to create a national patent system and provide a utilitarian basis to stimulate innovation or what was then known as the "useful arts."³⁷ It is also one of the only constitutional clauses incorporated without debate.³⁸ Perhaps because the delegates felt, as Mark Twain expressed it, that "a country without a patent office

³⁵ ABRAHAM LINCOLN, LECTURE ON DISCOVERIES AND INVENTIONS (FEB. 11, 1859) IN ABRAHAM LINCOLN: SPEECHES AND WRITINGS 1859-1865 11 (DON E. FEHRENBACHER ED., 1989).

³⁶ U.S. Const. art.I, § 8, cl. 8.

³⁷ EDWARD C. WALTERSCHEID, THE NATURE OF THE INTELLECTUAL PROPERTY CLAUSE: A STUDY IN HISTORICAL PERSPECTIVE 18 (2002).

³⁸ *Id.*

and good patent laws was just a crab and couldn't travel any way but sideways or backwards."³⁹

While patents have provided an incentive for national competitiveness⁴⁰ and offered a barrier to entry to stimulate investment in new technologies, especially in industries with high start-up and research and development costs, there is a general consensus that the crab is traveling backwards. The system is very much perceived to be broken.

The law calls for a patent to issue where an invention is novel, useful, non-obvious and described with enough specificity to inform the public how to practice the invention. Yet of the two million patents in force in the United States,⁴¹ many do not qualify. Adam Jaffe and Josh Lerner regale the reader in their book *Innovation and Its Discontents*⁴² with horror stories about patents that are anything but "non-obvious," such as patent number 6,368,227 for "Method of Swinging on a Swing" awarded to a five-year-old boy.⁴³ Or patent number

³⁹ MARK TWAIN, *A CONNECTICUT YANKEE IN KING ARTHUR'S COURT* 65 (Bantam Classics 1983) (1889).

⁴⁰ *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 146 (1989). ("From their inception, the federal patent laws have embodied a careful balance between the need to promote innovation and the recognition that imitation and refinement through imitation are both necessary to invention itself and the very lifeblood of a competitive economy.").

⁴¹ Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 *Nw. U. L. Rev.* 1495, 1501 (2001) (discussing the two million patents in force).

⁴² ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT* (2005); see also Rochelle Cooper Dreyfuss, *Pathological Patenting: The PTO as Cause or Cure*, 104 *MICH. L. REV.* (forthcoming) (review of Jaffe and Lerner).

⁴³ U.S. Patent No. 6,368,227 (issued April 9, 2002) (Method of Swinging on a Swing).

6,574,645, a patent on a method for drafting a patent.⁴⁴ The "Patently Silly" weblog has dozens more.⁴⁵

Applications come in and are granted for inventions that are not novel, as the statute requires. The patent awarded to Smucker's for the crustless peanut butter and jelly sandwich is, by now, legendary. Jaffe and Lerner describe a patent sought for expirationless options thirty years after economists won the Nobel Prize for the same idea. Now lawyers are getting into the game, trying to patent estate planning and other legal techniques that have been practiced in the industry for decades.⁴⁶ The problem is that, as we shall discuss in the next Section, as old and obvious as an idea might seem, finding the relevant prior art to invalidate it can often be quite difficult, especially under time and resource constraints. This creates an opportunity to exploit the deficiencies in the system.

An industry has arisen in patent "trolling," seeking patents solely for the purpose of litigating infringement lawsuits and extorting license fees from competitors without producing any product or bringing any innovation to market.⁴⁷ Patent law provides the inventor with a monopoly right to exclude others from using, selling, making or practicing⁴⁸ the invention but not a

⁴⁴ U.S. Patent No. 6,574,645 (issued June 3, 2003) (Machine For Drafting A Patent Application And Process For Doing Same).

⁴⁵ Patently Silly Weblog at <http://www.patentlysilly.com> (last visited Sep. 1, 2006).

⁴⁶ U.S. Patent No. 6,567,790 (issued May 20, 2003) (Establishing And Managing Grantor Retained Annuity Trusts Funded By Nonqualified Stock Options). See also Richard Gruner, Attorneys as Patent Infringers: Patent Restrictions on Tax Planning Methods, presented at Berkeley IP Scholars Conference (August 10, 2006), available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers2/GRUNER.rtf>.

⁴⁷ See also Zachary Roth, *Patent Troll Menace*, Washington Monthly (June 2005), <http://www.washingtonmonthly.com/features/2005/0506.rothsidebar2.html> (last visited Sept. 1, 2006).

⁴⁸ 35 U.S.C. § 101.

concomitant obligation to use, sell, make or practice that invention. Patents issue to the oil industry for solar energy inventions that will be put on the shelf and never used. Since everything under the sun is now patentable subject matter⁴⁹ and more people are filing patents,⁵⁰ the field is fertile for companies seeking to enrich themselves from bio-piracy,⁵¹ patent trolling, patent prospecting and other practices that do not satisfy the constitutional mandate. Of course, the increase in patent applications may also demonstrate an increase in innovation and productive research and development, but it is undisputed that it is also producing the problem of excessive patent litigation and trolling.

A consensus is emerging that there is a crisis of "patent quality." Because of a lack of access to adequate information and to the knowledge of how to apply it most effectively, the USPTO is granting undeserving applications. Bureaucrats are supposed to possess "the knowledge that comes from specialized experience."⁵² Yet the reality is that the supposedly expert bureaucrat - in this case fifty-five percent of patent examiners - has been at the USPTO for fewer than two years and is not required to possess an advanced degree.⁵³ It is not surprising given the fact that they are getting paid approximately \$55,000 and a first-year associate in a Manhattan law firm earns a base salary of \$145,000. In

⁴⁹ *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980).

⁵⁰ John R. Allison and Mark A. Lemley, *Who's Patenting What? An Empirical Exploration of Patent Prosecution*, 53 VAND. L. REV. 2099, 2099 (2000) (individuals and companies are obtaining far more patents today than ever before).

⁵¹ Kasturi Das, *Combating Biopiracy - the Legal Way* (2005) at <http://www.indiatogether.org/2005/may/env-biopiracy.htm> (last visited Sept. 30, 2005); see also the Convention on Biodiversity (1992).

⁵² Richard B. Stewart, *The Reformation of American Administrative Law*, 88 Harv. L. Rev. 1669, 1678 (1975).

⁵³ ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS 136 (2004).

addition to being underpaid, they are also overworked.⁵⁴ An examiner has an average of 18-20 hours to do the initial review of an application.⁵⁵ Arguably, we have returned to the registration regime we abandoned in 1836.⁵⁶

Patent bureaucrats enjoy a great deal more discretion than their counterparts at other agencies. They have responsibility for granting a twenty-year monopoly with limited supervision, oversight or review when a first or second year civil servant at another agency would be drafting memos. The wide-ranging discretion of agency officials would not be such a problem, Adam Jaffe and Josh Lerner point out in *Innovation and Its Discontents*, were it not for the fact that courts are increasingly likely to find in favor of patent holders.⁵⁷ The

⁵⁴ Gregory Aharonian, *A Few Patent Examiners Complain About Patent Quality*, PATNEWS, (January 28, 1999).

⁵⁵ H.R. REP NO. GAO-05-720 (June 15, 2005). *The USPTO Has Made Progress in Hiring Examiners, but Challenges to Retention Remain* (depending on the type of patent and the skill level of the examiner, each examiner is expected to process an average of 87 applications per year at a rate of 19 hours per application. United States Government Accountability Office Intellectual Property The USPTO Has Made Progress in Hiring Examiners, but Challenges to Retention Remain). See also, Brenda Sandburg, *Speed Over Substance?*, INTELL. PROP. MAGAZINE (March 1999).

⁵⁶ J. Giles and S. Rich, *Laying the Ghost of the "Invention" Requirement* 14 FED. CIR. B.J.163, 165 (2005) (We had an examination regime from 1790 to 1793 and then adopted a registration system from 1793 to 1836 but the outcry was so great that we had to return to examination and created the modern Patent Office to handle the work.).

⁵⁷ James Bessen & Michael J. Meurer, *Lessons For Patent Policy From Empirical Research On Patent Litigation*, 9 LEWIS & CLARK L. REV. 1, 22 (2005) ("There is also direct evidence that the Federal Circuit has changed patent validity and patent scope. The research must be used cautiously though, because it does not control for the selection effect. Allison and Lemley find the patent validity rate has increased since the creation of the Federal Circuit. Lunney finds that the Federal Circuit is less likely to find infringement than predecessor courts and thus has narrowed patent scope. Wagner and Petherbridge find Federal Circuit claim interpretation decisions are growing more predictable."); see also Jay P. Kesan and Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes*, U Ill. L. & Econ. Research Paper (2005) ("[S]ignificant percentage of cases (about 8-9%) are resolved on the merits through summary judgment. Consequently, summary judgments are important in patent cases for determining patent validity and infringement, and the summary judgments related to patent validity occur earlier in the litigation compared to summary judgments related to patent infringement. This result is somewhat encouraging given the important role played by the courts in revoking patent rights improvidently granted at the outset

Supreme Court rarely hears patent-related certiorari petitions⁵⁸ (2006 being a notable exception).⁵⁹

Patents are consequently both stronger, easier to get and more likely to be upheld without any concomitant guarantee of their quality. This has led to a system that sometimes rewards invention at the expense of innovation. In other words, the inventor may receive the boon of the patent monopoly but the "useful arts," that the Constitution aims to advance are not promoted. Instead, the current system has generated tremendous uncertainty with regard to the role patents play in the marketplace. Whether the cause or the effect, there are double the number of patent applications today and the backlog has risen to over 1 million.

Understanding what the statute requires of examiners illuminates the desperate need for information to do the work. (Those expert in patent law can skip the next pages that detail those requirements). The Patent Office once possessed that information in its libraries, but its predominance as a scientific repository has fallen into desuetude.

by the PTO. Nevertheless, despite the fact that such rulings occur early in the proceedings compared to patent trials, we should still be concerned about the huge transaction costs associated with patent litigation because summary judgments in general, and summary judgment based on invalidity in particular, are expensive compared to summary judgments granted on other grounds."), available at <http://ssrn.com/abstract=808347>.

⁵⁸ Mark D. Janis, *Intellectual Property Challenges in the Next Century: Patent Law in the Age of the Invisible Supreme Court*, 2001 U. Ill. L. Rev. 387, 387 (2001) (The Supreme Court has rendered itself well nigh invisible in modern substantive patent law. The Court of Appeals for the Federal Circuit, created in 1982, has become the de facto supreme court of patents.).

⁵⁹ See generally *eBay Inc. v. MercExchange, LLC.*, 126 S. Ct. 1565 (2006); *Illinois Tool Works, Inc., v. Indep. Ink, Inc.*, 126 S. Ct. 1281 (2006); *LabCorp v. Metabolite Labs., Inc.*, 126 S. Ct. 2921, 165 L. Ed. 2d 399 (2006)(dismissing writ of cert.); *MedImmune, Inc. v. Genentech, Inc.*, 126 S. Ct. 1329 (2006); *KSR Intn't v. Teleflex*, 126 S. Ct. 2965 (2006).

Inventors apply for one of three types of patents: utility, plant or design. We focus our description of the review process on the more numerous and problematic utility patent process in large measure because this is where the tremendous backlog arises. Utility patents are those that cover any "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement."⁶⁰ This definition of patentable subject matter is understood broadly to cover "everything under the sun,"⁶¹ including business methods, computer algorithms and even living organisms. Not patentable are laws of nature, natural phenomena, abstract ideas and mathematical algorithms.⁶²

An inventor files an application electronically or by mail to secure a filing date from which the twenty-year monopoly grant of rights will begin if the patent is granted. That written and signed application by the inventor (not its assignee) contains a "specification," illustrations, an oath as to ownership and truthfulness and, of course, the requisite filing fee. The specification includes a narrative description of the invention with details as to the background of invention and any relevant prior inventions that must be disclosed. The specification also contains a brief summary as well as the detailed description of the invention being claimed. The metes and bounds of the invention for which the patent is sought are set out in the patent's "claims," which are the formalistic statements of the scope of the invention. These short and long written descriptions together with the claims comprise the specification. The application must also set forth the "best mode" for implementing the invention.

⁶⁰35 U.S.C. § 101 (2004).

⁶¹ *Diamond v. Chakrabarty*, 447 U.S. 303, 309-10 (1980).

⁶² 35 U.S.C. § 101 (2004).

Applications must be for workable inventions not merely theoretical ideas and therefore the description of the proposed practical implementation is intended to ensure that the invention has a certain practical utility.

There is a well-established information taxonomy by which patents are sorted and organized. The application is assigned to one of seventeen examination groups and within the appropriate group assigned to a specific "art unit" that specializes in the relevant technology. The Patent Office labels the claims within an application with one of the hundreds (450) of classes and thousands (150,000) of sub-class designations to enable indexing, sorting and retrieval of the application and materials relevant to it.⁶³

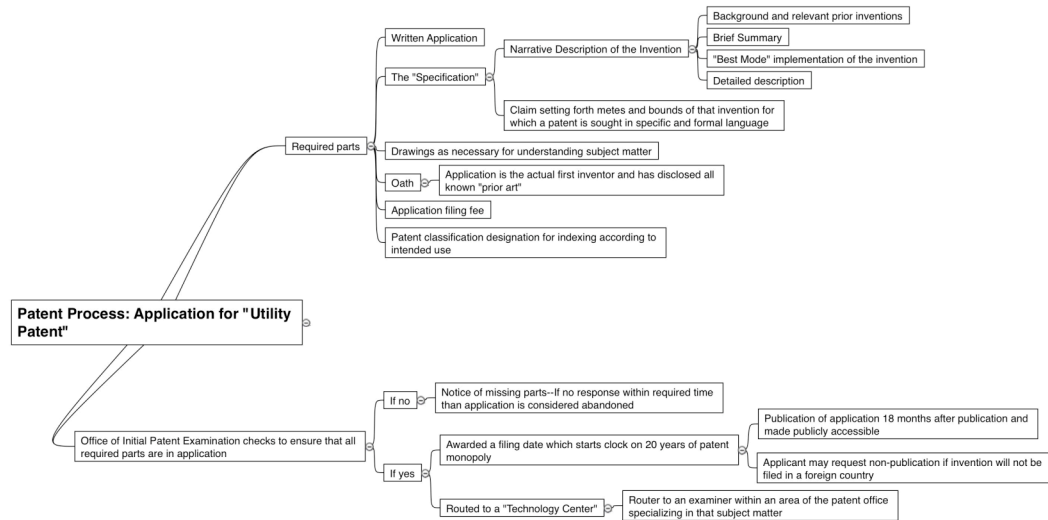


Figure 1 - The Patent Application Process

In the course of the ensuing patent review, the examiner may correspond with the inventor in a series of colloquies known as "office actions" whereby the

⁶³ United States Patent Office, U.S. Patent Classification Help File available at <http://www.uspto.gov/web/patents/classification/help.htm> (last visited January 23, 2006).

examiner rejects and the applicant amends. The inventor can amend the application during the course of patent prosecution in response to these office actions in an effort to narrow the claims until they are appropriate for patenting. Even if the examiner eventually rejects the application, an inventor may respond by filing a continuation or amendment⁶⁴ or by filing an appeal with the Board of Patent Appeals and Interferences. Prosecution ends when the patent is either granted or the application is abandoned.

The examiner reviews an application for compliance with five major statutory criteria: patentable subject matter, utility, novelty, non-obviousness and enablement. The first requirement is that the application be for patentable subject matter. This requires rejecting erroneously filed applications (i.e. mistaking copyrightable material such as a novel) as well as patent applications that seek to gain a monopoly over an idea, conception, law of nature or other abstract phenomenon. While they may be living organisms, patents must be something invented by man and not discovered in nature.

Patents are almost never rejected for "utility," the requirement that patents be for operable and functioning inventions and that those inventions serve the purpose stated in the patent application. While inventions need not be fully reduced to practice or ready for sale on the open market, the utility requirement is intended to ensure that inventors do not simply file "hunting licenses."⁶⁵ The Supreme Court has clearly stated that patents are "not a reward for the search, but a compensation for its successful conclusion."⁶⁶ The utility

⁶⁴ 37 C.F.R. § 1.116 (2004).

⁶⁵ *Brenner v. Manson*, 383 U.S. 519, 536 (1966).

⁶⁶ *Id.*

requirement is generally a more significant hurdle for pharmaceutical products and biotechnology than for mechanical inventions.⁶⁷

The core of the examination centers around two questions: is the invention new and is the invention enough of an advance over what came before as to be not obvious to those with expertise in that area of invention.

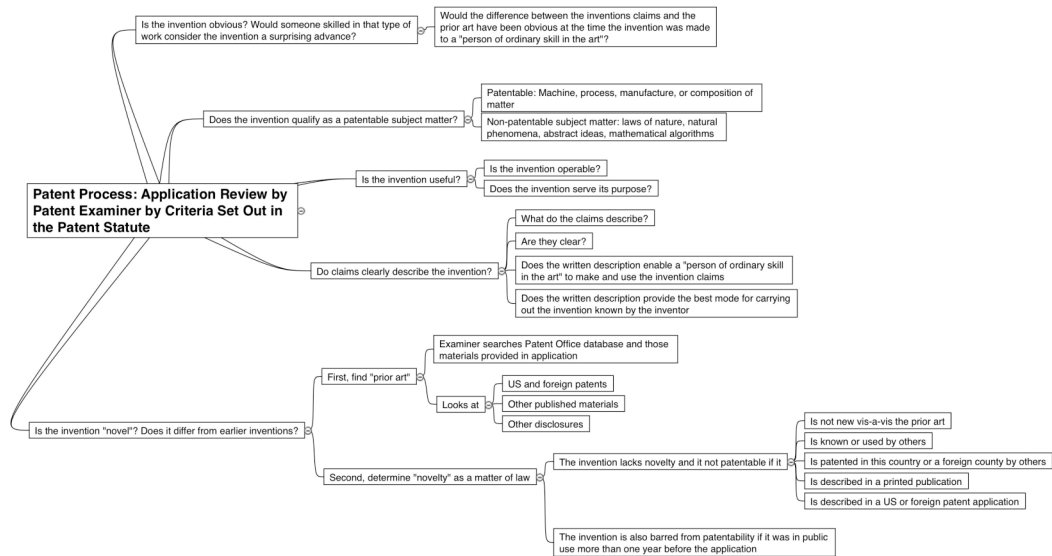


Figure 2 - Statutory Criteria for Patent Examination

The question of the patent's novelty must be ascertained before the application can proceed. Essentially, the examiner is asking whether the claimed invention differs from previous inventions and whether the invention was in public use (e.g. on sale or published) by anyone else, including the inventor. The inventor's own public use more than one year before the application precludes patenting. To answer the question of novelty, he or she must find the "prior art," know-how that predates the invention that might pre-empt it. Prior art is not

⁶⁷ DONALD S. CHISUM, CHISUM ON PATENTS § 4.01 (2006) (citing *In re Fisher*, 421 F.3d 1365 (Fed. Cir. 2005)).

limited to patents or patent applications. It can include published materials, such as journal articles, websites or other disclosures that might suggest that the invention is not new.

In practice, the examiner has too little information or too little knowledge of how to apply available information in order to render a decision. The examiner searches an internal Patent Office database containing U.S. and foreign patent applications and certain journals in an effort to find prior art. While some examiners might use Google to look up information online, the use of Internet research is severely restricted for security reasons (ie. Risk that examiner searching will be tracked). In more than half the technology centers⁶⁸ (formerly known as examining groups) at the USPTO, Internet research is forbidden.⁶⁹ The examiner is limited to those sources he can find on his own from the office.

This gives rise to a "goldilocks" problem: too little information, too much information and none of it just right.⁷⁰ In searching for prior art, know-how that

⁶⁸ For a list of the USPTO Technology Centers, see <http://www.uspto.gov/web/info/pat-tech.htm>.

⁶⁹ U.S.P.T.O., PARTS, FORM, AND CONTENT OF APPLICATION, MANUAL OF PATENT EXAMINING PROCEDURES (MPEP) 904.02(c) (8th ed. 2004) ("When the Internet is used to search, browse, or retrieve information relating to a patent application which has not been published, other than a reissue application or reexamination proceeding, Patent Organization users MUST restrict search queries to the general state of the art unless the Office has established a secure link over the Internet with a specific vendor to maintain the confidentiality of the unpublished patent application. Non-secure Internet search, browse, or retrieval activities that could disclose proprietary information directed to a specific application which has not been published, other than a reissue application or reexamination proceeding, are NOT permitted. This policy also applies to use of the Internet as a communications medium for connecting to commercial database providers."). See also Internet Usage Policy, 64 F.R. 33056, Art. 4 (June 21, 1999) ("If security and confidentiality cannot be attained for a specific use, transaction, or activity, then that specific use, transaction, or activity shall NOT be undertaken/conducted.")

⁷⁰ See also, Jay Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERK. TECH. L.J. 763, 763 and 767 (2002) ("It is widely recognized that the Patent Office grants overly-broad patents because it has deficient knowledge of the relevant prior art, especially in high technology areas with significant nonpatent prior art.").

predates the invention that might pre-empt it and invalidate the patent's claims, such as patents or journal articles, websites or other disclosures that might suggest that the invention is not new, the examiner sometimes turns up nothing. While the patent may sound like something familiar that's come before, often she cannot find other written material that actually teaches the claims of the patent. Alternatively, she is so inundated with related prior art but has trouble in the time allotted to review an application, winnow the material and find art that is relevant and useful for the examination process.⁷¹ Even if she can find art that is pertinent, she still may have trouble knowing from the perspective of one practicing in that area if the patent is an obvious or non-obvious inventive leap over the combined prior art references.

A patent examiner, especially those who may not use the Internet, must find their information from two computer systems in place at the United States Patent Office: 'EAST' (Examiner's Automated Search Tool) and 'WEST' (Web-Based Examiner Search Tool). In addition, there is a database of foreign patent filings. These databases provide access to prior U.S. patents, foreign patent abstracts, certain pending U.S. applications, and additional proprietary database libraries. Examiners can conduct full-text searching of published applications since 2001 and patents granted since 1970 as well as access optically-scanned copies of patents since 1920.⁷² Patent applications, of course, also contain

⁷¹ Eli Kintisch, *US Patent Policy: USPTO Wants to Tap Experts to Help Examiners*, SCIENCE, 19 May 2006 at 982, available at <http://www.sciencemag.org/cgi/content/full/312/5776/982b>.

⁷² U.S.P.T.O., PARTS, FORM, AND CONTENT OF APPLICATION, MANUAL OF PATENT EXAMINING PROCEDURES (MPEP) 902.03(e) (8th ed. 2004) ("The automated search tools on examiners' desktop computers include the Examiner's Automated Search Tool (EAST), the Web-Based Examiner Search Tool (WEST), and the Foreign Patent Access System (FPAS).").

references to prior art. Contrary to popular assumption, the Patent Office databases are limited and do not contain the corpus of scientific knowledge.⁷³

In Sampat's recent study⁷⁴ of 502,687 utility patents, he finds that examiners have a disadvantage in searching for non-patent prior art or foreign patents.⁷⁵ Interestingly, while patent examiners account for 41% of the citations to previous U.S. patents, they account for only 10% of references to non-patent prior art. "If an applicant does not search for prior art and thereby does not report a piece of relevant prior art on his/her information disclosure statement, the examiner is less likely to discover it if it is codified in the non-patent literature or a foreign patent than if it is codified in a U.S. patent, since examiner capabilities for searching for U.S. patents exceed their capabilities for searching other sources of prior art."⁷⁶

Particularly in cutting-edge areas of innovation where information may not be available in patent applications, examiners are not digging up what they need. Applicants are not required to provide it.⁷⁷ "Because the applicant need

⁷³ Paul Edward Geller, *An International Patent Utopia?*, 25 EUR. INTELL. PROP. REV. 515, 516 (2003) (calling for the creation of open, global databases and the linking of local patent databases into a globally distributed database to facilitate global searching).

⁷⁴ Bhaven Sampat, *Determinants of Patent Quality: An Empirical Analysis* (2006), available at http://siepr.stanford.edu/programs/SST_Seminars/patentquality_new.pdf_1.pdf.

⁷⁵ Bhaven Sampat, *Determinants of Patent Quality: An Empirical Analysis* 3 (2006), available at http://siepr.stanford.edu/programs/SST_Seminars/patentquality_new.pdf_1.pdf.

⁷⁶ Bhaven Sampat, *Determinants of Patent Quality: An Empirical Analysis* 13 (2006), available at http://siepr.stanford.edu/programs/SST_Seminars/patentquality_new.pdf_1.pdf.

⁷⁷ The applicant is required to disclose any information which is material to the prosecution of the patent. Oath or Declaration, 37 CFR 1.63(b)(3) (2004). According to Chisum, "Traditionally, standard practice in the Patent and Trademark Office did not require the applicant to disclose or cite items in the prior art believed to be relevant to the patentability of claims in the application. The examiner searched the prior art and cited relevant items in reasons given for rejection of claims. Furthermore, an applicant and his or her patent attorney were under no duty to conduct a search of the prior art." Chisum

only provide material information of which he or she is aware, and is not required to search for any of this information, the informational burdens on the examiner are clearly heavy—even before the examiner engages in the heavy lifting of interpreting the prior art.”⁷⁸ The Patent Act provides that the Commissioner of Patents should create procedures to prevent pre-issuance protests or opposition. That has been interpreted to mean that only prior art without commentary can be submitted. Hence third-party comment⁷⁹ must be made by mail within a two-month window for a fee of \$180 and without commentary and is, therefore, rarely invoked. The patent examiner may not respond to the third party (except to process the fee).⁸⁰

It is not enough to ensure that the invention is new. The crux of the patentability determination is whether the invention represents a significant enough advance over what came before. The “obviousness” determination inquires as to whether: “the differences between the subject matter sought to be

on Patents, 6-19 Chisum on Patents § 19.03 (b) (2006). Sometimes applicants file no prior art at all. See, e.g. Tim Palmer, *Applicants not Citing Any Prior Art: Scary*, Patent Chronicles (March 23, 2005, 3:30 pm), available at <http://www.patentchronicles.com/archives/20050323/applicants-not-citing-any-artscary/> (The USPTO has proposed a rule change to “encourage patent applicants to provide the USPTO the most relevant information related to their inventions in the early stages of the review process. As a result, patent applications could be processed in a more streamlined and effective manner.”). Changes To Information Disclosure Statement Requirements and Other Related Matters, 71 Fed. Reg. 38808 (10 July 2006).

⁷⁸ Lee Petherbridge, *Positive Examination*, 46 IDEA 173, 183 (2006).

⁷⁹ Patent Act, 35 U.S.C. § 122(c) (2004). The Manual of Patent Examining Procedure Rule 1134.01 implementing the Code of Federal Regulations, 37 CFR 1.99, provides that third parties may submit prior art without commentary in response to a published but not-yet-granted application. Within two months of publication, someone may submit no more than 10 patents and publications. They may not highlight or mark up the materials submitted. They must pay \$180 for the privilege of submitting prior art. The patent examiner may not respond to the third party (except to process the fee).

⁸⁰ Robert Clarke, Office of Patent Legal Administration, Presentation at meeting of USPTO (Feb. 16, 2006).

patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."⁸¹ As patent scholar Rebecca Eisenberg explains, "this language seems to call for evaluations of non-obviousness from the perspective of ordinary practitioners who are contemporaries of the inventor in the relevant technological community. It specifies a point in time as of which the obviousness of the invention should be evaluated ('at the time the invention was made') and designates the person whose judgment of obviousness should control ('to a person having ordinary skill in the art to which said subject matter pertains' or PHOSITA), as well as directing attention to 'the differences between the subject matter sought to be patented and the prior art.'"⁸²

The examiner's manual suggests three bases for assessing obviousness. There must be "some suggestion or motivation" available to one of ordinary skill in the art, "to modify the reference or to combine reference teachings." In other words, there needs to be evidence that one with some expertise in this arena would know and want to make the modifications that would produce the jump from what came before to what is claimed in the application. Second, "there must be a reasonable expectation of success" in making that leap. Finally, the

⁸¹ 35 U.S.C. § 103 (2004).

⁸² Rebecca Eisenberg, *Ideas Into Action: Implementing Reform of the Patent System: Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERK. TECH. L.J. 885, 886 (2004).

prior art, whether a single item of art or the existing literature when combined, "must teach or suggest all the claim limitations."⁸³

Essential to this determination is that the examiner put himself in the shoes of the fictional person skilled in the art and render the decision through her eyes and not his own. This requires identifying this person and what characterizes her skill set.⁸⁴ The person skilled in the art is considered to be the best metric for the scope, content and meaning of prior references. But the ultimate determination of patentability is a legal one.⁸⁵ While the person skilled in the art could bring training, judgment, intuition, practical knowledge and skills in the craft, the examiner may not consult such persons directly and, instead, must, at present, be content to substitute his judgment.

The Federal Circuit has further denigrated the role of the person skilled in the art by rarely turning to the expert. "Today, PHOSITA sits on the sidelines of obviousness analysis. Courts consult PHOSITA on the scope, content and meaning of prior art references but not on the ultimate question of whether the invention would have been obvious at the time it was made in light of the prior art. The resulting analysis excludes from consideration the judgment, intuition and tacit knowledge of ordinary practitioners in the field that cannot be

⁸³ U.S.P.T.O., PARTS, FORM, AND CONTENT OF APPLICATION, MANUAL OF PATENT EXAMINING PROCEDURES (MPEP) 706.02(j) (8th ed. 2004).

⁸⁴ See *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) ("Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.")

⁸⁵ See *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) ("[T]he ultimate question of patent validity is one of law...").

documented in the written record. The written record understates the technological know-how that active practitioners bring to bear upon a problem, particularly in fields of industrial technology that offer few incentives to publish."⁸⁶

Finally, the patentability determination requires that the applicant clearly disclose the scope and content of the invention and "enable" one of ordinary skill in the art to practice the invention. Again, the determination as to whether the application is complete and clear must be made by the patent examiner. The central *quid pro quo* of the patent regime is the exchange of the monopoly grant of rights for a full informational disclosure to the public. Patents offer the stronger protection than trade secret in order to force this sharing of information. Hence Section 112 demands that the application not only describes the invention but also ensures that the public can make use of it once the patent monopoly expires. "The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention."⁸⁷

The Patent Office, translates the statutory rules for patentability set forth in the Patent Act into a set of procedures detailed in the Manual of Patent Examining Procedure. These require the examiner – without assistance from the public – to assess the application for statutory subject matter, utility, novelty,

⁸⁶ Rebecca Eisenberg, *Ideas Into Action: Implementing Reform of the Patent System: Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885, 888 (2004).

⁸⁷ 35 USC § 112.

obviousness and enablement. In so doing, the examiner has to put himself in the shoes of the person having ordinary skill in the art (PHOSITA), by bringing scientific know-how to bear on the review while still applying legal tests of patentability. The patent examiner is accorded a high degree of deference by courts reviewing the examiner's work because it is believed that only the centralized and expert bureaucrat has the ability to understand both the science and the law necessary to rule on patentability. To prevent the corruption and capture of the examiner and unfairness to the applicant, he is not permitted to consult outside sources nor is the public permitted to submit any commentary or analysis after publication and before the grant of the patent application. Hence the review process is insular and, as a result, unnecessarily flawed.

Part III: Why Traditional Peer Review is Not the Solution

The traditional solution proposed to remedy the information deficit and information quality problem in administrative agencies, generally, is peer review. We must pause to consider, therefore, whether traditional peer review panels might solve the patent information deficit. Peer review provides a mechanism for oversight of agency science and is a practice in widespread use in government, academia and industry. "Refereeing procedures," such as peer review, writes Sheila Jasanoff, "have come to be regarded as the most effective method of validating science in two quite different spheres of professional activity: prepublication review of journal articles and screening of applications by federal research sponsoring agencies. There is thus an appealing logic to the

sylogism that links peer review to "good science" in the regulatory process."⁸⁸ As we shall discuss, however, the logic is fallacious. Traditional peer review suffers from considerable problems that make it ill-suited to remedying the information deficit. Because it is a closed process, peer review is not the right way to obtain good information, either for the patent process or, ultimately, for agencies.

Through peer review, researchers allow other experts to examine, criticize and improve their work.⁸⁹ This enhances the quality of science and innovation while maximizing the efficient use of the scarce resource of time. Peer review allows colleagues to evaluate each other and in so doing to "certify the correctness of procedures, establish the plausibility of results, and allocate resources."⁹⁰

Peer review⁹¹ is in common use in government.⁹² The National Science Foundation and the National Institutes of Health both use peer reviewers to

⁸⁸ SHEILA JASANOFF, *THE FIFTH BRANCH: SCIENCE ADVISORS AS POLICY MAKERS*, 61 (1990).

⁸⁹ See Carnegie Commission on Science, Technology, and Government, *Risk and the Environment: Improving Regulatory Decision-making*, Carnegie Commission, New York 75 (1993). See, e.g. DeploymentLink, *Peer Review Essential for Scientific Advances* (Sept. 1, 2001), available at http://deploymentlink.osd.mil/news/sep01/news_90401_001.shtml ("Scientists say peer review is a critical quality control principle in the planning, design, conduct and interpretation of scientific research. Peer review of research reflects scientists' commitment to careful and objective pursuit of knowledge. Through peer review, researchers allow other experts to examine, criticize and improve their work.")

⁹⁰ DARRYL J. CHUBIN, EDWARD J. HACKETT, *PEERLESS SCIENCE: PEER REVIEW AND U.S. SCIENCE POLICY 2* (1990).

⁹¹ U.S. GEN. ACCOUNTING OFFICE, *DEPARTMENT OF EDUCATION: COMPLIANCE WITH THE FEDERAL ADVISORY COMMITTEE ACT AND LOBBYING RESTRICTIONS*, GAO/GGD/OGC-00-18 (Dec. 30 1999); U.S. GEN. ACCOUNTING OFFICE *PEER REVIEW: COMPLIANCE WITH THE PRIVACY ACT AND FEDERAL ADVISORY COMMITTEE ACT*, GAO/GGD-91-48 (Apr. 17 1991); U.S. GEN. ACCOUNTING OFFICE, *PEER REVIEW: EPA NEEDS IMPLEMENTATION PROCEDURES AND ADDITIONAL CONTROLS*, GAO/IRCED-94-98 (Feb. 22 1994); U.S. GEN. ACCOUNTING OFFICE, *FEDERAL ADVISORY COMMITTEES: ADDITIONAL GUIDANCE COULD HELP AGENCIES BETTER ENSURE INDEPENDENCE AND BALANCE*, GAO-04-328, (Apr. 1 2004); U.S. GEN. ACCOUNTING OFFICE, *FEDERAL RESEARCH: PEER REVIEW PRACTICES AT FEDERAL SCIENCE*

determine if research is novel and represents a contribution to its field.⁹³ The National Science Foundation currently relies on a network of over 50,000 reviewers.⁹⁴ The National Institutes of Health relies on outside review groups and advisory councils from the scientific community to review over 70% of its applications.⁹⁵ The Environmental Protection Agency grant selection process relies heavily upon "Science Review Panels" which are peer review groups chosen and managed by an outside scientist.⁹⁶

Typically, a professional elite⁹⁷ conducts the peer review that opines on work product within the discipline. Governmental peer review is not as far

AGENCIES VARY, GAO/RCED-99-99 (Mar. 1 1999); U.S. GEN. ACCOUNTING OFFICE, PEER REVIEW: REFORM NEEDED TO ENSURE FAIRNESS IN FEDERAL AGENCY GRANT SELECTION, GAO/PEMD-94-1 (Jun. 24 1994); U.S. GEN. ACCOUNTING OFFICE, FEDERAL ADVISORY COMMITTEES: GSA'S MANAGEMENT OVERSIGHT AND GAO COMMENTS LEGISLATIVE AMENDMENTS, GAO/T-GGD-890 1 (Oct. 5 1998); U.S. GEN. ACCOUNTING OFFICE, UNIVERSITY FUNDING: INFORMATION ON THE ROLE OF PEER REVIEW AT NSF AND NIH, GAO/WED-87-87FS (Mar. 26, 1987); U.S. GEN. ACCOUNTING OFFICE, FEDERAL ADVISORY COMMITTEE ACT: GENERAL SERVICES ADMINISTRATION'S MANAGEMENT ADVISORY ACTIVITIES, GAO/GGB89-10 (Oct. 5 1988).

⁹² See Lars Noah, *Scientific "Republicanism": Expert Peer Review and the Quest for Regulatory Deliberation*, 49 EMORY L.J. 1033, 1045 (2000). See also, Sidney A. Shapiro, *OMB's Dubious Peer Review Procedures*, 24 ENVTL. L. REP. 10064 (2004).

⁹³ Cf. J.B. Ruhl, *Prescribing The Right Dose Of Peer Review For the Endangered Species Act*, 83 NEB. L. REV. (2004) (discussing scientific peer review and arguing against excessive reliance on peer review).

⁹⁴ National Science Foundation, *How We Work* (Jul 15, 2005) at <http://www.nsf.gov/about/how.jsp> (last visited Sept. 30, 2005). See also Thomas O. McGarity, *Peer Review in Awarding Federal Grants in the Arts and Sciences*, 9 BERK. TECH. L.J. 1, 7 (1994).

⁹⁵ See National Institutes of Health, Center for Scientific Review, at <http://cms.csr.nih.gov/AboutCSR/Welcome+to+CSR> (last updated Aug. 4, 2005).

⁹⁶ Thomas O. McGarity, *Peer Review in Awarding Federal Grants in the Arts and Sciences*, 9 BERK. TECH. L.J. 1, 26 (1994).

⁹⁷ "Individual agencies define peer review somewhat differently; however, all of the agencies' definitions or descriptions of peer review contained the fundamental concept of a review of technical or scientific merit by individuals with sufficient technical competence and no unresolved conflict of interest. U.S. GEN. ACCOUNTING OFFICE, PEER REVIEW PRACTICES AT FEDERAL SCIENCE AGENCIES VARY, GAO/RCED 99-99 (March 1999), available at <http://www.gao.gov/cgi-bin/getrpt?GAO/RCED-99-99>.

ranging as in academia. Industry and academic peer reviewers are used by agencies to vet grant proposals and conduct site visits to university labs.⁹⁸ Agencies use peer review, according to the General Accounting Office to: "(1) assess the merit of competitive and noncompetitive research proposals, (2) determine whether to continue or renew research projects, (3) evaluate the results of the research prior to the publication of those results, (4) establish annual budget priorities for research programs, and (5) evaluate program and scientist performance. All of the agencies who use peer review do so to assess competitive research proposals for funding (e.g. NIH and NSF use peer review to award grants for scientific research) having nothing to do with science in policymaking. The methods for conducting peer reviews vary among and within the agencies. For example, the agencies select peer reviewers from academia, private industry, and government and obtain review comments, not only in person during site visits, but by mail, in workshops or a combination of methods.⁹⁹ Scientific peer reviewers, however, do not decide policy and, as a general matter, they do not set budget priorities or allocate resources (except as between research proposals). EPA peer reviewers, for example, oversee the scientific research conducted by outside groups for the agency under its Office of

⁹⁸ For example, NSF uses 58,000 peer reviewers each year to study 40,000 proposals and submit 250,000 separate evaluations. See NAT'L. SCI. FOUNDATION, REPORT OF THE NATIONAL SCIENCE BOARD ON THE NATIONAL SCIENCE FOUNDATION'S MERIT REVIEW SYSTEM (Sep. 30, 2005), NSB-05-119, available at www.nsf.gov/nsb/documents/2005/0930/merit_review.pdf. See also How We Work, <http://www.nsf.gov/about/how/jsp> (last updated July 15, 2005). See also STRENGTHENING PEER REVIEW IN FEDERAL AGENCIES THAT SUPPORT EDUCATION RESEARCH, CENTER FOR EDUCATION (National Academies Press, 2004); Thomas O. McGarity, *Peer Review In Awarding Federal Grants in the Arts and Sciences*, 9 BERK. TECH. L.J. 1, 15 (1994).

⁹⁹ U.S. GEN. ACCOUNTING OFFICE, PEER REVIEW PRACTICES AT FEDERAL SCIENCE AGENCIES VARY, GAO/RCED 99-99 (March 1999), available at <http://www.gao.gov/cgi-bin/getrpt?GAO/RCED-99-99>.

Research and Development's \$40 million dollar research budget.¹⁰⁰ They do not necessarily have a voice in decision-making.¹⁰¹ In no instance is an agency accountable to the scientific community.¹⁰²

While lawmaking is not under the purview of science, Congress has tried to increase the use of peer review (even as it mandates that agencies reduce the number of Federal Advisory Committees) in agencies to improve the quality of information used and disseminated by them. The Information Quality Act (IQA) legislates that data will be of sufficient quality under the Act and therefore that government will be able to make decisions based on that information if, according to OMB's interpretive guidelines of the IQA, it is subjected to independent peer review.¹⁰³ In its Final Information Quality Bulletin for Peer Review, OMB set forth detailed requirements for peer review that focused on "timing of peer reviews, selection of reviewers, transparency of review, and opportunities for public participation."¹⁰⁴ The OMB Guidelines mandate that agencies set up peer review processes and involve the public in them.

¹⁰⁰ About EPA, <http://www.epa.gov/epahome/aboutepa.htm> (last updated Aug. 24, 2005).

¹⁰¹ Stephen Johnson, *Junking the "Junk Science" Law: Reforming the Information Quality Act*, 58 ADMIN LAW REV. 37 (2006); see also Michelle V. Lacko, *The Data Quality Act: Prologue To A Farce Or A Tragedy?*, 3 EMORY L.J. 305 (2004).

¹⁰² E. Donald Elliott, *Strengthening Science's Voice at the EPA*, 66 L. & CONTEMP. PROBS. 45, 58 (2003) (It has become a canon of institutional faith at EPA that scientists should just stick to the facts and not make policy recommendations.).

¹⁰³ Office of Mgmt. & Budget, *Information Quality Guidelines*, 67 Fed. Reg. 369 (Jan. 3, 2002), reissued with corrections, 67 Fed. Reg. 8452, 8459 (Feb. 22, 2002).

¹⁰⁴ Stephen Johnson, *Reforming the Information Quality Act*, 58 ADMIN. L. REV. 60 (2005) (quoting Final Information Quality Bulletin for Peer Review, 70 Fed. Reg. 2664, 2671 (Jan 14, 2005)).

This is not a surprising approach since agencies have longstanding experience with peer review practices,¹⁰⁵ which are, of course, in widespread use in the scientific community. "It is an integral practice to the development of quality research in the private and public sectors, in industry and in education because the process of peer review allows even a large group of scientists, regardless of geographic proximity, to collaborate on the evaluation of innovation."¹⁰⁶ As Robert Reich, former Secretary of Labor, explains, such regularized review processes are well-suited to the workings of administrative agencies: "[T]he postwar intellectual and political project in policymaking became the reconciliation of the practical necessity of broad administrative discretion with this emerging pluralist norm. The "solution" was found in the idea of *administrative process*. Henceforth, public administrators would become managers of neutral processes designed to discover "optimal" public policies. The hallmark of the administrator became procedural expertise in using a set of techniques applicable to all sorts of public problems rather than substantive expertise in solving particular kinds."¹⁰⁷ As such, peer review represents a fairly conservative means to attack the information quality problem and would seem, at first glance, to provide the much needed oversight and accountability.

¹⁰⁵ Mohammed Kashef, Scientific Peer Review In The Public Sector (last modified Dec. 5, 2005), available at http://dotank.nyls.edu/communitypatent/peerreview_dec05.pdf.

¹⁰⁶ Mohammed Kashef, Scientific Peer Review In The Public Sector (last modified Dec. 5, 2005), available at http://dotank.nyls.edu/communitypatent/peerreview_dec05.pdf.

¹⁰⁷ Robert Reich, *Public Administration and Public Deliberation: An Interpretive Essay*, 94 YALE L.J. 1617, 1619 (1985).

In fact, peer review is fraught with problems that undermine its credibility.¹⁰⁸ Were it not for the fact that it can be significantly improved upon, it might be caviling to attack governmental peer review, though, leading scientific organizations already have.¹⁰⁹ First, let us identify the shortcomings in order to demonstrate the argument that open review presents the better alternative.

The problems of traditional peer review stem from the fact that it is an elite, closed process and therefore subject to manipulation. Not necessarily closed in the sense of secretive,¹¹⁰ but in the sense that agency peer review groups are empanelled not self-selected. It is therefore possible to stack the deck with ideologues and to create peer review mechanisms that are fraught, not with

¹⁰⁸ SHEILA JASANOFF, *THE FIFTH BRANCH: SCIENCE ADVISORS AS POLICY MAKERS* (1990); Wendy Wagner, *The "Bad Science" Fiction: Reclaiming the Debate over the Role of Science in Public Health and Environmental Regulation*, 66 L. & CONTEMP. PROBS. 63, 67ff. (2003) (criticizing how "good science" reforms attempt to promote greater peer review); Sidney A. Shapiro, *Peer Review and the Politicization of Government Science*, in *RESCUING SCIENCE FROM POLITICS*, (Wendy Wagner, Rena Steinzor, eds., 2006), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=910915.

¹⁰⁹ See OMB Watch, *Peer Review News*, available at <http://www.ombwatch.org/article/archive/232> (archive of objections to OMB peer review guidelines). See also *Defending Science*, *OMB's Peer Review Guidelines*, at http://www.defendingscience.org/public_health_regulations/peer_review_guidelines.cfm (last visited Aug. 30, 2006). See also Chris Mooney, *The Politics of Peer Review*, in *Committee for the Scientific Investigation of Claims of the Paranormal* (Jan. 8, 2004), available at <http://www.csicop.org/doubtandabout/peerreview/> ("Given all this, you might expect that a recent White House Office of Management and Budget proposal to expand the use of peer review in the evaluation of scientific research conducted by federal agencies would find a warm welcome from scientists. You'd be dead wrong. Scientific heavyweights like the American Public Health Association, the Association of American Medical Colleges, and the Federation of American Societies for Experimental Biology have issued scathing critiques of the proposal (the latter two jointly), as have a range of other organizations and experts. The hallowed American Association for the Advancement of Science--which publishes the preeminent peer reviewed journal *Science*--also has worries about the idea. A group of Democratic members of Congress even dubbed it a "wolf in sheep's clothing.").

¹¹⁰ The purpose of the Federal Advisory Committee Act is to ensure that advice rendered by advisory committees is open and accessible. Federal Advisory Committee Act, Pub. L. 92-463, 5 U.S.C., App 2 6(c) (2) (2006).

deliberative disagreement, but unproductive conflict. Because the membership of these groups is closed, the community itself has no say over who participates. Typically, only certain kinds of industry and academic experts will be invited. Those limitations need not be based on politics – though a political litmus test is frequently imposed¹¹¹ – but may, however, be based on status and thereby shut out otherwise qualified participants with meaningful contributions.

There is no single set of procedures that define peer review. Its practice varies widely across agencies. Hence there are no required mechanisms to ensure transparency in the work of agency peer reviewers. The mere fact that these panels share the name “peer review” with that of rigorous academic counterparts does not ensure the quality of their work (nor that of academic peer review). There are no assurances that what they do is based on good science rather than political prejudice. GAO has found that "further improvements are needed to expand the scope of peer reviews [at EPA] and make them more independent," and that the implementation of EPA's peer-review policy has been "uneven."¹¹²

¹¹¹ To serve on the NIH Drug Abuse panel, candidates were asked if they had voted for President Bush. See William R. Miller, *Litmus Test for Appointees at the National Institute on Drug Abuse*, available at http://www.ucsusa.org/scientific_integrity/interference/nih-drug-abuse-panel.html (last updated Aug 10, 2005).

¹¹² Alan Charles Raul and Julie Zampa Dwyer, *Science in the Regulatory Process*, 66 L. & CONTEMP. PROB. 7, n.24 (2003) ([The] GAO has "identified several weaknesses in EPA's science programs over the years, including (1) the uneven implementation of peer review procedures for EPA's scientific and technical products, (2) gaps in scientific data, and (3) the lack of performance goals and measures that show the environmental results of EPA's science activities.") (quoting U.S. GEN. ACCOUNTING OFFICE, GOVERNMENT PERFORMANCE AND RESULTS ACT: INFORMATION ON SCIENCE ISSUES IN EPA'S PERFORMANCE REPORT FOR FISCAL YEAR 1999 AND PERFORMANCE PLANS FOR FISCAL YEARS 2000 AND 2001, Pub. No. 00-270 ,(2000)).

Peer review is also time-consuming to organize¹¹³ and to run.¹¹⁴ Because the group has to be selected, vetted and approved and fights can arise over membership, it is a difficult process. Conflicts of interest have to be identified and sorted out. Participants have to be convinced to join. Not only does the composition of the group need to be selected and defended, but the scope of its work can be contested. Hence, setting up peer review panels requires boundary setting and policing and the defense of those boundaries.

It is, perhaps, in part because of the work that must go into maintaining a peer review system that review generally happens late – too late in the process to have a maximum impact on regulatory decision-making. The same complaint is frequently leveled against citizen participation practices more generally. Agencies ask for public comment once a rule is already written, often allotting the public a short window in which to provide feedback and leaving little room for meaningful change.¹¹⁵ As Raul and Dwyer comment: “[I]n many cases, end-of-the-line review cannot repair mistakes or omissions made early in the regulatory development process or fill data gaps. Back-end inspection may be

¹¹³ Sidney Shapiro, *Data Quality: The Data Quality Appropriations Rider: New Procedures and Information Disclosure*, Center for Progressive Reform at <http://www.progressiveregulation.org/perspectives/dataQuality.cfm> (last visited August 14, 2006) (“While ensuring high-quality information is a worthy goal, procedural requirements have an important side effect – they slow down the government’s capacity to act and, if they are sufficiently burdensome, they can bring government to a standstill. As a result, the benefits of imposing additional procedures have to be balanced against the consequences to the public of delaying agency action.”).

¹¹⁴Megan Sever, *Government Peer Review*, GEOTIMES (Nov. 2003), available at http://www.agiweb.org/geotimes/nov03/NN_peerrev.html (“Opponents, however, warn that the standards could paralyze new regulations, especially on issues such as global warming, or air or water pollution, where the risks and benefits are complex, politically charged and potentially costly.”)

¹¹⁵ The Administrative Procedure Act provides for a minimum window of 30 days of public consultation. See 5 U.S.C. § 554(d) (2006).

able to identify scientific uncertainties, but rarely can it reduce them. The benefits of regulatory science quality control must also be balanced against the potential for peer reviewers to intrude on the policy domain. If determining whether the data and analysis are adequate for regulatory decision-making is the problem, then peer review does not solve the problem. It shifts the problem from decision makers to reviewers."¹¹⁶

But the closed process fits well with the culture and practice of agencies. "By deferring to expertise and asserting it ourselves, we help create a world organized around the pretense that some people, armed and limited by their special knowledge, can be trusted to be in charge," Write Gerald Frug.¹¹⁷ The peer review process arguably shores up this self-proclaimed expertise by lending credibility to the agency's assertion of expert knowledge. Frug goes on to point out, quoting the moral philosopher, Alasdair MacIntyre, that "'Bureaucratic Man' can thrive only if all of us invent a fiction of expertise that assigns to the character of the 'broad-gauged' leader a role that justifies our own powerlessness."¹¹⁸

¹¹⁶ See Alan Charles Raul and Julie Zampa Dwyer, *Science in the Regulatory Process*, 66 L. & CONTEMP. PROB. 7, 13 (2003).

¹¹⁷ Gerald Frug, *The Ideology of Bureaucracy in American Law*, 97 HARV. L. REV. 1276, 1333 (1984).

¹¹⁸ Gerald Frug, *The Ideology of Bureaucracy in American Law*, 97 HARV. L. REV. 1276, 1333 (1984).

*Part IV: "Peer to Patent": The Open Review Alternative*¹¹⁹

We need institutional processes by which to overcome the problems of closed peer review and create more transparent mechanisms that bring scientific expertise to bear earlier in the process. We also need ways to do this that are not overly time-consuming and burdensome for the patent examiner or for long-suffering inventors who are already waiting years on line at the USPTO. We have witnessed how the combination of open technology and well-defined process has enabled Wikipedia to elicit the wisdom of the crowd and led to the creation of an encyclopedia with over 1,000,000 entries of quality comparable to that of traditional encyclopedias with centralized editors.¹²⁰ New technology has enabled Amazon to create a marketplace, not just for the sale of goods and services, but also for the aggregation of expertise and recommendations about those goods and services.¹²¹ CNet offers a platform to broker expertise about electronics and technology. The Internet Movie Database, the largest repository of information about cinema, is created by volunteers submitting data about

¹¹⁹ For a complete description of the Peer to Patent proposal, please see Beth S. Noveck, *Peer to Patent*, 20 HARV. J. L. TECH. ____ (2006); see also Nicholas Varchaver, *Patent Review Goes Wiki*, FORTUNE MAGAZINE, Aug. 21, 2006, at 18, available at http://money.cnn.com/magazines/fortune/fortune_archive/2006/08/21/8383639/index.htm?source=yahoo_quote.

¹²⁰ See Wikipedia, at <http://www.wikipedia.org> (as of this writing, there are 1,312,000 entries). See Jim Giles, *Internet Encyclopaedias Go Head To Head*

Jimmy Wales' Wikipedia Comes Close To Britannica In Terms Of The Accuracy Of Its Science Entries, A Nature Investigation Finds, NATURE (Dec. 14, 2005; updated March 28, 2006) (revealing that study by Nature demonstrates that Wikipedia is about as inaccurate as Encyclopedia Britannica).

¹²¹ See Shay David and Trevor Pinch, *Six Degrees of Separation: The Use and Abuse of Online Review and Recommendation Systems*, FIRST MONDAY (March 2006) (describing strategies and techniques of user reviews and recommendations on Amazon).

films and movie stars.¹²² Public Library of Science, the pioneering open access publisher of scientific journals, is launching PLoS One, a distributed knowledge network to enable scholars of biology and medicine to discuss published research literature.¹²³ We are learning as a result of these experiences with online collaboration that often "ordinary" people possess extraordinary knowledge they are willing to share when it is easy to do.¹²⁴ This peer-production of content works well online.¹²⁵ By making participation open and subject to self-selection, we can leverage, not only the wisdom, but also the enthusiasm of the crowd.¹²⁶ Experience with the tools now available is undermining traditional assumptions about how expertise must be organized and pointing the way toward open models of scientific review, not only to create encyclopedias or book reviews,¹²⁷ but also – and this is the radical proposal – to inform legal decision-making.

¹²² Internet Movie Database, available at <http://www.imdb.com>. See also Internet Movie Database entry on Wikipedia, available at <http://en.wikipedia.org/wiki/IMDb> ("The IMDb website consists of the largest known single accumulation of data on individual films (including complete cast and crew listings), television programs (including complete cast and crew listings), direct-to-video product and videogames reaching back to their respective beginnings, and worldwide in scope... Information is largely provided by a cadre of volunteer contributors, with only 17 members of the staff dedicated to monitoring the data received) (last updated Aug. 15, 2006).

¹²³ http://www.plos.org/news/announce_plosone.html

¹²⁴ Yochai Benkler, *Freedom in the Commons: Towards a Political Economy of Information*, 52 DUKE L.J. 1245, 1256 (2003) (stating that peer production is the collaborative process by which individuals "contribute to a joint effort" to produce "information or culture").

¹²⁵ ¹²⁵ See Yochai Benkler, *Coase's Penguin, or, Linux and The Nature of the Firm*, 112 YALE L.J. 369 (2002) (discussing collaboration in the context of open source, and other peer-review projects).

¹²⁶ JAMES SUROWIECKI, *THE WISDOM OF THE CROWD* (2004) (demonstrating how groups of people can be smarter and more effective at certain kinds of decisions than individuals).

¹²⁷ MediaCommons, a new endeavor from the Institute for the Future of the Book, will involve communication studies scholars in real-time open peer review, see Kathleen Fitzpatrick, *Introducing MediaCommons* http://www.futureofthebook.org/blog/archives/2006/07/introducing_mediacommons_or_ti.html (July 17, 2006).

First, we will outline how an open peer review process for patent examination could work and then, we will discuss the advantages of such a change for the way the agency operates. The goal is to illuminate the normative and practical desirability of openness by reference to some of the key design features.¹²⁸ If we are to succeed in lobbying for open review, we need to demonstrate exactly how it addresses the problems of a closed system.

The proposed system for open review tackles the "goldilocks dilemma" by enabling the community of practice to collaborate on finding prior art, evaluating the application and transforming the "person skilled in the art" from a fictional legal personage into a real group.¹²⁹ This system augments review by the lone examiner with assistance from experts in the relevant art area, revolutionizing the way patents are examined and providing a model for expert participation in regulatory decision-making.¹³⁰ The United States Patent and

¹²⁸ There are existing examples of patent commentary websites, though these are not linked to Patent Office decision-making. See Prevalent.de Software Patents, available at <http://prevalent.de/index.pl?site=1&subsite=3&lang=en>. See also CAMBIA Patent Lens, which offers patent searching and will eventually offer annotation, available at <http://www.patentlens.net/daisy/patentlens/patentlens.html> ("The Patent Lens contains patent documents from the European and United States patent offices and filed under the Patent Cooperation Treaty (PCT) in a format that is fully integrated and searchable. The Patent Lens also offers technology landscapes, which describe key areas of plant biotechnology and the patent claims surrounding them. In addition you will find patent tutorials, information on patent policies, and news and views in the world of IP.") See also PatentWiki, <http://www.patentwiki.org>.

¹²⁹ For related earlier proposals pertaining to patent bounties, see John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305 (2001) (arguing that awarding prior art informants with a bounty assessed against applicants, the Patent Office can restore order to the patent system and reduce its social costs.); Joseph Scott Miller, *Building a Better Bounty: Litigation-Stage Rewards for Defeating Patents*, 19 BERK. TECH L.J. 667 (2004). See also Michael Felton, *A Call for Bounty Hunters*, in *Patents and Property* (March 2001), available at <http://pubs.acs.org/subscribe/journals/mdd/v04/i03/html/03patents.html>.

¹³⁰ ADAM B. JAFFE AND JOSH LERNER, *INNOVATION AND ITS DISCONTENTS* 22 (2005) ("Until the process is changed so that other parties that know something about the technology surrounding a given application have the opportunity and incentive to bring that

Trademark Office has adopted the proposal as part of its Strategic Initiatives and will launch a pilot of open review in 2007.¹³¹ The European Patent Office (EPO) is considering following suit. The project has captured the imagination of some of the world's largest and most active patent holders, who have agreed to let some of their own patents be reviewed openly. These include: IBM, Microsoft, Oracle, Intel, Hewlett-Packard and Red Hat.

It is illogical to have one person – with access to limited information – determining originality¹³² and whether the inventor slept on his rights¹³³ as well as obviousness¹³⁴ or even enablement¹³⁵ when we can harness the collective intelligence and experience of thousands. Many technological advances are not described in commonly available academic publications or those sources to which the patent examiner has easy access. It is also illogical to turn to a single private firm, as the Patent Office once suggested, to conduct this review when those with the deepest experience in any given area of innovation and bring their expertise to bear.¹³⁶

knowledge forward, there will be no cost-effective way to fix the problem of low quality patents.").

¹³¹ See U.S.P.T.O. Draft Strategic Plan 2007-2012, 71 Fed. Reg. 50048 (2006), available at <http://www.uspto.gov/web/offices/com/strat2007/index.htm>.

¹³² 35 U.S.C. § 102 (2004) (novelty).

¹³³ *Egbert v. Lippmann*, 104 U.S. 333, 337 (1881) ("The invention, forming the springs of corsets of two or more metallic plates, placed one upon another, and so connected as to prevent them from sliding off each other laterally or edgewise, was completed and put to use in 1855. The inventor slept on his rights for eleven years. Letters-patent were not applied for till March, 1866.").

¹³⁴ 35 U.S.C. § 103 (2004) (non-obviousness).

¹³⁵ 35 U.S.C. § 112 (2004) (enablement).

¹³⁶ USPTO, *The 21st Century Strategic Plan* (2003) (To achieve greater examiner productivity by reducing their prior art search responsibilities, the USPTO is looking at market driven examination options.) at

The pilot will focus on creating an online system to assist with novelty review by allowing for the submission of prior art. The novelty determination is ideally-suited to peer review because it enunciates a clear goal, requires only minimal participation to address and lends itself to self-selection on the basis of expertise.¹³⁷ Far better for me to designate what I am good at since I am in the best position to know.¹³⁸ While a patent examiner might have to search for prior art for hours, an expert knows instantly whether an invention is reminiscent of earlier work or avenues of research. Designed right, the software can make participation for a network of scientific and innovation experts clear and easy.

As Eric Raymond, hacker "anthropologist" says, with many eyeballs "all bugs are shallow." Just as a community of open source programmers is well-suited to spotting mistakes in code, the peer to patent community is equipped to address whether an invention is novel or resembles something seen before. A prior art novelty review is an opportunity to get more public input into the patent system and introduce citizen consultation, the common and required practice of every government agency,¹³⁹ into the intellectual property review process.¹⁴⁰

<http://www.uspto.gov/web/offices/ac/comp/proc/pctsearch/pctsearchhom.html>
(last visited Sept. 30, 2005).

¹³⁷ See STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* 62 (2004) ("The key element of the open source process, as an ideal type, is voluntary participation and voluntary selection of tasks.").

¹³⁸ See GUIDO CALABRESI, *THE COST OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* (1970) (Calabresi discusses the notion that the entity in the best position to carry the "burden" is the one that should.).

¹³⁹ Administrative Procedure Act §1, 5 USCS § 553 (b) (1946) (General notice of proposed rule making shall be published in the Federal Register, unless persons subject thereto are named and either personally served or otherwise have actual notice thereof in accordance with law.) See also, 5 USCS § 553 (c) (1946) (After notice required by this section, the agency shall give interested persons an opportunity to participate in the rule

How Will It Work?

Under the current design planned for implementation, Patent applicants request review of a specific patent application under the Community Patent Review process. They can request review of a published application (under current rules, this happens at eighteen months) or, if they choose, they can consent to early publication. Significantly, the Patent Office has consented for purposes of the pilot project to jump participating applications to the front of the queue for expedited review. At this point, the patent application data is transferred from the USPTO database to the Peer to Patent system and made available for the comment period.

Peer reviewers can search for applications of interest. In addition, electronic notifications of the new application's availability go out to the peer review community by means of electronic subscription. Using RSS (really simple syndication)¹⁴¹ those with an interest in a particular area of art, whether it is class

making through submission of written data, views, or arguments with or without opportunity for oral presentation.). On the application of administrative law to the patent system, see Stuart Benjamin and Arti Rai, *Who's Afraid of the APA? What the Patent System can Learn from Administrative Law*

¹⁴⁰ USPTO, *The 21st Century Strategic Plan* (2003) (To achieve greater examiner productivity by reducing their prior art search responsibilities, the USPTO is looking at market driven examination options, including outsourcing prior art review to private firms) *at* <http://www.uspto.gov/web/offices/ac/comp/proc/pctsearch/pctsearchhom.html> (last visited Sept. 30, 2005).

¹⁴¹ While the Patent Office does not offer syndication, a private website, Fresh Patents does. See <http://www.freshpatents.com> (last visited October 19, 2005). See also *Introduction to RSS*, (revised April 14, 2003) (Really Simple Syndication (RSS) is an XML format designed for sharing headlines and other Web content. RSS defines an XML grammar for sharing content. Each RSS text file contains both static information about a website or weblog, plus dynamic information about new stories, all surrounded by matching start and end tags) *at* <http://www.webreference.com/authoring/languages/xml/rss/intro/> (last visited Sept. 30, 2005). For more about the use of RSS in government, see <http://www.rssgov.com> (last visited December 5, 2005).

482 Exercise Devices or class 438 Semiconductor Device Manufacturing,¹⁴² can receive notification of the name and abstract of any new inventions filed via email or mobile phone for initial review. This makes it simple, not only to learn about published applications, but also to share that information with others since it is the expert in the community of practice who will know who and how to find the other experts with knowledge of a particular area of art.

Peer reviewers can invite more experts to subscribe and participate.

Visualization aids reveal web site activity and make the Community Patent peer review community visible to itself. Such aids might include visualizations of the number of applications and which applications have the most comments. Visualization makes it easier for a subscriber – whether it is a industry or academic scientist, a graduate student or professor or a competitive inventor and her lawyers – to see the quantity of applications historically published in each class and sub-class in order to know how broadly to subscribe and avoid being overwhelmed as well as to see the level of activity within the Community. One needs to know in advance that Class 514 Drug, Bio-Affecting and Body Treating Compositions, is the most populous class, and that one ought to sign up for relevant sub-classes, or that Needle and Pin Making received only 1 application last year.

The system will promote “lonely patents” by advertising under-subscribed patent classes and subclasses for review to the network of experts. It might employ a collaborative filtering system akin to Amazon’s to suggest

¹⁴² The Patent Classification System can be found online arranged alphabetically, by subject matter, by class number and by art unit. See, <http://www.uspto.gov/web/offices/opc/>

patents to review (e.g. "people who submitted prior art for this patent also read that patent."). Experts will receive RSS or email notifications of patents for which no prior art has yet been submitted. Reviewing one patent application will generate a prompt: "Would you like to review another?" Again, if the system is designed to optimize inputs and facilitate participation, it can reduce the burden of reviewing a patent for novelty and commenting on prior art.

In addition, reviewers can "tag" or label applications, not only according to the official classification taxonomy, but also by their own designations. This kind of supplementary community self-tagging - or what is sometimes called a "folks-onomy"¹⁴³ - might make it easier to find applications of interest by allowing experts to apply other labels to identify an invention in the terminology that is common to his or her specialty. In other words, what the patent office calls Exercise Devices, my commonly be known among physical therapists as elliptical machines. What the Patent Office might refer to as semi-conductor manufacture, the reviewer might also label "chip." Such a folksonomy could make labeling more granular and precise to speed up the process of self-assignment.¹⁴⁴ We already have tagging and labeling software that allows Internet users to label content for easier retrieval, indexing and searching.¹⁴⁵

¹⁴³ For more on folksonomies, see Wikipedia, <http://en.wikipedia.org/wiki/Folksonomy> (last updated January 1, 2006). See also, Clay Shirky, *Ontology is Overrated: Categories, Links, and Tags*, at http://www.shirky.com/writings/ontology_overrated.html (last visited January 2, 2006).

¹⁴⁴ "Zoo Bank" is creating just such a user-created taxonomy and classification system in another arena. The technique and the technology could be adopted to classifying inventions. See *Commentary: A Universal Register for Animal Names*, 437 *Nature* 477 (Sep. 22, 2005).

¹⁴⁵ See del.icio.us About Page, <http://del.icio.us/doc/about> (last visited Sept. 30. 2005).

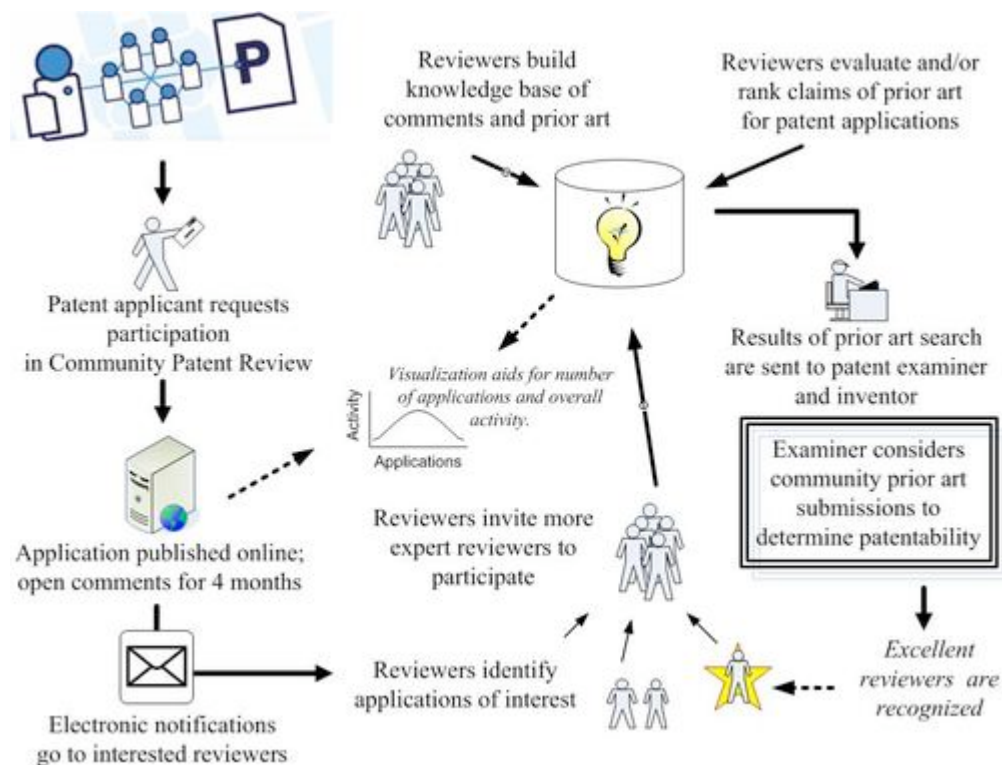


Figure 3 - Open Review Pilot Process

Each application will reside on a web page where members of the community of practice and interest can submit relevant prior art for a two-month window after publication.¹⁴⁶ Two months tracks the amount of time currently available to members of the public wishing to submit prior art under CFR Rule 1.99.¹⁴⁷ Rule 1.99 provides that third parties can submit prior art within that two

¹⁴⁶ There once existed a private service known as BountyQuest where inventors could post an application and pay for third parties to submit prior art as a mechanism to strengthen the quality of the application and find any prior art before the fact. See Sabra Chartrand, *Patents: Disproving Idea Ownership*, N.Y. TIMES, October 23, 2000, available at <http://www.nytimes.com/2000/10/23/technology/23PATE.html?ex=1143262800&en=b13756e07e50dd38&ei=5070>. See also John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 307 (2001) (proposing "that the Patent Office recruit members of the public to act as private patent examiners. By awarding prior art informants with a bounty assessed against applicants, the Patent Office can restore order to the patent system and reduce its social costs.")

¹⁴⁷ 37 CFR § 1.99 (2004).

month window and after paying a fee. That number could just as easily be three or four months, however, and experience should be used to decide on the appropriate time horizon.

To enable prior art peer review, as we are describing here, the Patent Office, at least initially, has agreed to waive the filing fee of \$180 to facilitate submission of art.

More significantly, two months creates a manageable window of time in which to learn about and submit prior art without overwhelming the examiner or the community with too much data to review. By delimiting the time for submission of prior art, this could aid the examiner while drastically accelerating the process of review from the average 2-4 years¹⁴⁸ that the Patent Office currently requires. By speeding up the review process, we also speed up the time for scientists to publish and publicly discuss innovation without the fear of triggering a statutory bar.¹⁴⁹

A peer reviewer logs onto the system in order, as we shall discuss, to: 1) rate claims, 2) submit prior art examples, 3) comment on the patent or on specific prior art submissions, 4) rate prior art submissions, 5) rate prior art, 6) rate peer reviewers.

¹⁴⁸ USPTO FAQ, (Aug. 14, 2003) (Currently, the average patent application pendency is 24.6 months. Applications received in the U.S. Patent and Trademark Office are numbered in sequential order and the applicant will be informed within eight weeks of the application number and official filing date if filed in paper. If filed electronically, the application number is available within minutes.) *at*

<http://www.uspto.gov/main/faq/p220026.htm> (last visited Sept. 30, 2005).

¹⁴⁹ 35 U.S.C. §102 (b); 35 U.S.C. §102 (e); (Section contains three different patent bars; the "printed publication" bar, the "on-sale" bar, and the public use bar. *See also*, *Midland Flour Milling Co. v Bobbitt*, 70 F.2d. 416 (1934) (holding prior publications rest upon same ground as prior patents so far as anticipation is concerned and no valid patent can be obtained if invention or device is disclosed in printed publication.)

That logon need not be verified or even persistent. We want a small hurdle to prevent junk from being submitted but not so high a hurdle as to create a stumbling block to participation. At this stage of the game, the Patent Office ought to want good prior art from anywhere and anyone who has it. It does not matter if the party is interested or dispassionate. In fact, competitive interest will be a driver and incentive to finding relevant prior art and participating in the system.

The challenge at this stage is to ensure that the prior art submitted is relevant and manageable. There are several ways to accomplish this. We want to create legal mechanisms to help the examiner find the prior art that is "just right" and speaks to the patent's central claims. We do not want to wind up the machinery of peer review where it is not needed. Instead, we want to channel the expertise of the group where it is most needed and useful.

First, the design of the system will enable the community to designate the claims that are the crux of the invention and where research should be focused. An application might recite a method for sending and receiving electronic signals by means of a special hash algorithm. The examiner does not need prior art pertaining to sending and receiving, which are common steps. Rather, the Community's attention should be directed to finding prior art pertaining to the hash algorithm. Eventually, the examiner himself rather than the community can also be made to identify the central claims by voting.

Second, directions, instruction and even moderation by members of the community are essential at every step in the process to create a strong ethos of community and encourage the submission of useful and appropriate materials.

Wikipedia uses various mechanisms from written directions to community peer review and deletion to ensure that entries posted are, in fact, appropriate for an encyclopedia and adhere to standards of quality. The community itself will reject entries without references or sources.

Third, the interface will be designed to require a submitter to identify the claim to which a piece of prior art pertains, the date of the prior art submitted and whether the submission pertains to novelty or obviousness or a statutory bar.¹⁵⁰ This will make participation easier to review and more manageable for the examiner by allowing him to winnow out prior art that post-dates the invention. It also makes it easier, especially for a patent with dozens of claims, for the examiner and the community to assess the relevance of that submission. "This article invalidates claim 3" is more useful than "this article invalidates this patent."

Fourth, all submitted prior art will be added to a community knowledge base and be searchable and for use by everyone in future application reviews. This will avoid submission of duplicate entries. A member of the community should be able to know at one glance whether the article or patent he is proposing to submit has already been cited in the process.

Fifth, as on the technology news website Slashdot where peers moderate each other's postings in order to enable readers to filter out quality comments as adjudged by the community, members of the peer to patent community will rate

¹⁵⁰ We can take the International Search Report filed by an examiner in a PCT (Patent Cooperation Treaty) review. In such a report, the examiner cites prior art with the appropriate and relevant passages noted, indicates the claim to which such prior art speaks and labels the submission with one of 9 codes, including X, Y or A where X stands for novelty, Y stands for obviousness and A stands for general state of the art. *See* International Search Report model form at MPEP §1844.01.

the prior art for relevance.¹⁵¹ The output at the end of the process will be a rank ordered list of prior art, identifying the top ten submissions as judged by the community. This has the effect of winnowing the submissions and making them more useful and manageable to the examiner. At the end of the process, a report of the top 10 submissions will be delivered to the examiner. The examiner will still have access to the full list, which he can search, as he would any database, but, in this case, the database will have been ordered not by machine but by people with relevant expertise.

Under current rules, the public may not comment on prior art submitted to the United States Patent Office. Yet, to make participation meaningful and manageable, peer reviewers need to add comments to their submissions in order for others to rate and rank them. It is also more useful to an examiner to have an explanation of a prior art submission and its relevance to the patent's claims. This problem might be solved in various ways. Eventually, the rules might be changed. In the interim, we are solving it with applicant consent and asking inventors to agree to allow commentary by third parties on their applications.

Other experience with peer production systems teaches that participation will be enhanced through status and reward. Members of the community who post should receive "karma effects," status points for submitting prior art that is deemed relevant by the community.¹⁵² This encourages submitting of prior art

¹⁵¹ Slashdot moderates its site based on similar principles. The community decides which contributors and content is best and that information rises to the top. See also Slashdot, a "News for Nerds" site which uses a moderation system for both articles and authors that allows for a largely self-governed news outlet that obviates most hierarchical editorial functions at <http://slashdot.org> (last visited Aug. 10, 2006).

¹⁵² There are numerous existing social reputation software systems. Some of these websites focus on social or dating relationships and offer rating systems whereby people are "rated" based on who they know and who their friends are. In other words, the

and can help to make active participation a rite of passage in this community of practice. It might come to be an important part, for example, of being a graduate student in this field or being a junior scientist in a corporation working in a particular area of art. Members of the community can rate each other's participation. In addition, the system might award points to "submitter of the month" or "ranker of the month." These designations might be augmented by what the patent examiner ultimately finds to be useful and cites on the file wrapper. One gets rewarded for submitting art deemed relevant by the community and even more points for art that is eventually used in the final determination by the examiner. By tying status to relevance, the institution of online peer review can encourage, not only participation per se, but better quality participation and the submission of art that is useful and practical.

With these mechanisms in place for self-selected and open peer review of patent applications, we can empirically test the ability and willingness of the scientific community to contribute to the patent examination process. With evidence that such a process is useful, it will be possible to expand a pilot into

wildly popular Friendster or Orkut provide a graphical map of my friendships. Cyworld, another social networking service boasts a quarter of the population of Korea as its user base. Linked In provides such a map for my business relationships. Epinions bills itself as a "web of trust" system. It allows me to create a network of trusted reviewers. Slashdot moderates its site based on similar principles. The community decides which contributors and content is best and that information rises to the top. Virtual worlds, like Second Life, have a social reputation system based on interactions between players. Kuro5hin which uses mojo to allow users to moderate the site. Mojo is a time-weighted average of comment ratings, in order to set the "initial" rating for each new comment. Time spent with another player indicates friendship. New publishing models also rely heavily on social reputation software to filter content. Outfoxed is a service that "uses your network of trusted friends and experts to help you find the good stuff and avoid the bad" by using social reputation as a criterion in web surfing. There is already a wide variety of social reputation tools even though we are just at the beginning of their evolution and are sure to see the development of a wide new array of technological structures designed to measure social reputation. See Beth Simone Noveck, *Trademark Law and the Social Construction of Trust: Creating the Legal Framework for On-Line Identity*, 83 WASH. U. L. Q. 1733 (2006).

institutionalized practice and to justify allowing examiners to communicate with the scientific public.

Part V: Why Open Review

The open review system being constructed by the Community Patent Review project for the USPTO allows: 1) submission of prior art and commentary in response to the pending application of a consenting applicant; 2) where the community identifies the claims that are most relevant; and 3) directions and tutorials create a strong ethos of community and a clear indication about how to participate; and 4) participation is chunked into manageable tasks, including the rating and ranking of other people's postings in order to produce a manageable top 10 list of prior art submissions; and 5) successful participation, as determined by an examiner's use of submitted prior art, generates positive reputation points. This, in short, is the outline of an open system that overcomes the problems of closed peer review while providing more information into the decision-making process in a manageable form.

There are strong reasons why inventors, examiners and peer reviewers will want to participate in such a system.

For the inventor, the critical need is to get at better information to strengthen the patent application. Applicants want to know about prior art before the patent issues in order to avoid the cost of unnecessary litigation later. But any improvements to the examination process must not come at the cost of efficiency. Community Patent Review addresses this need by helping inventors

to uncover relevant prior art through community vetting. As one lawyer put it, this system "affords the only real opportunity to implement the statutory standard for obviousness, i.e., obvious to a person of ordinary skill in the art at the time the invention was made." He went on to say that, "a timely intervention by such a person is worth 10 expert witnesses, 10 years after the fact. It also helps crystallize the knowledge in the art within a particular time frame. One of the great difficulties in patent litigation, particularly with software, is reconstructing prior art methods that were known to exist at the time of the invention, but cannot be resurrected in sufficient detail to constitute clear and convincing evidence."¹⁵³ Early review preempts the expensive costs of later litigation and produces a stronger and more valuable patent. The pilot will show whether community peer review, in fact, increases the value of licenses for the technology. Done right, such a system can also speed the review of patents, especially when participation jumps an inventor to the front of the line.

For the Patent Examiner

For the Patent Examiner, the urgent and crucial problem is one of backlog. Examiners are overwhelmed. There is a fear that public participation will create more rather than less work. The USPTO is also under political fire and does not want to expend any social capital on reforms that do not work. The proposal is sensitive to and addresses these needs by giving the examiner the top ten prior art references (and a ranked list of additional references) as suggested

¹⁵³ Email from Peter Canelias, Adjunct Professor, New York Law School, to author (Mar. 17 2006, at 06:26 EST) (on file with author).

by an expert community. The data is ranked and searchable. With expert input over a bounded period of time, the Examiner has help with winnowing the pool and determining relevance for novelty and obviousness review. Such a system helps to create a "living database," a vital community of practice to assist with review on an ongoing basis. The design of the system would help pass along such scientific questions to the community while reserving ultimate legal decision-making for the Examiner. The hope is also that Community Patent Review, by opening up the examination process, will encourage applicants to write better researched and less ambiguous applications that are easier to review. The pilot also produces meaningful empirical data so that before any rule changes are enacted, reform is supported by evidence.

For the Peer Reviewer

Finally, for the peer reviewer, the problem is one of time. It has to be easy to participate and relevant to the decision-making process. The incentive to participate is to produce better patent quality in a given arena of scientific invention but this must not come at too high a cost. Peer review and scrutiny by a jury of one's inventive and intellectual peers can promote innovation, which benefits all. The design, not only of the technology but of the workflow process at the Patent Office, takes this into account by enabling participation by a variety of means, including submitting prior art, ranking art, ranking participation and commenting. It is not necessary for everyone to invest a great deal of time on each application. Rather, people can participate for smaller amounts of time.

Also with appropriate structures of status and reward and the successful integration of such peer review institutions into existing communities of practice, participation in Community Patent Review will confer status on the peer reviewer.

For the Public

We are expending millions on unnecessary litigation and unjustified settlements of bad patents that never should have issued. Reform proposals abound but the public has no way to choose effectively among them without evidence as to what really works. Community Patent Review is designed to address this urgent problem by winnowing out bad claims before they issue. Open review offers myriad benefits for the public. We will discuss each one of these in turn. In sum, it:

- Eliminates the institutional and status boundaries of expertise
- Reduces the work of administering peer review or public participation and potentially accelerates decision-making
- Improves decision-making for the better by opening up the flow of information while making it manageable
- Makes government more accountable to science
- Ensures that decisions comport with scientific fact
- Will not only make more science available, it will reveal debates over that science
- Introduces information into the process early

- Obviates the need to await litigation to challenge the basis of decision-making
- Promotes deliberation around issues of national importance
- Increases oversight over the regulatory process
- Is more expert and more participatory

"When a handful of distinguished gentlemen came together in post-Restoration England to set up the Royal Society, they agreed that membership should be open only to the better sort. Allowing tradesmen and artisans to join the collective search for truth seemed too dangerous to be tolerated, for, after all, the worldly interests of such people might corrupt their decisions about what counted as genuine knowledge."¹⁵⁴ Open review abandons this now-outdated vision of expertise. In so doing, it can eliminate the problems of lack-of-transparency and manipulation that plague closed peer review panels because it opens up the process via the Internet, allowing peer reviewers to self-select, rather than to be selected. If the aim is to get at good prior art, it does not matter where it comes from so long as it is provided. Often, the best wisdom comes, not from the center, but from the periphery among the enthusiasts and hobbyists or from graduate students who are immersed in but not yet well known for their knowledge of the discipline. Opening up review also reduces the burden on any one group of people over time by increasing the number of people potentially engaged in the process.

In addition, opening up the process and eliminating closed boundaries not only introduces more and better information from new sources, but it also

¹⁵⁴ PHILIP KITCHER, SCIENCE, TRUTH AND DEMOCRACY 29 (2001).

exercises a self-policing effect. Participants are not constrained by professional allegiances nor do they become entrenched in the culture and practices of a small, closed group. Scholarly debates are open playing-fields where everyone participates in a common conversation. Similarly, an open system for science in policymaking would provide greater accountability among scientists to each other, regardless of whether they are in academia, industry or the public sector.

While there is an up front cost to setting up the software and the processes by which open review will be conducted, it minimizes the workload after the fact. There is no need to empanel juries or to police their boundaries. As in the "Peer to Patent" system, the software can do the work of rating and ranking participants and promoting the best submissions, as decided by the community, to the front of the queue for consideration. If the work to be done is made as granular as possible, it further reduces the workload by allowing more people to participate for less time.

It will potentially improve decision-making by opening up the flow of information from the public and from the scientific community while, at the same time, leveraging technology to make that flow manageable for participants and government officials alike. We propose to transmit only the top 10 items of prior art, as identified by the community, to the patent examiner. We need to start exploring ways to embed procedure into software in order to make public participation practicable and in order to let the community itself participate in vetting the quality of information.

Having such processes readily deployable will make it possible to render government more accountable to the scientific community and to integrate legal

and scientific considerations. It is possible and desirable, not to eliminate the patent examiner, but to create a dialogue between the process of scientific fact-finding and legal fact-finding. Given that in the U.S. Patent Office (unlike the European Patent Office) most examiners possess only an undergraduate degree in a science (and not necessarily related to the area in which they examine) and that in other agencies, "very few of the participants in the policymaking dialogue at high levels within the Agency were scientifically trained,"¹⁵⁵ open review integrated into the decision-making process creates mechanisms to inform the work of the bureaucrat. Organizing the voice of science places added pressure on agencies to make accountable decisions. It also reduces the risk of manipulation of science by the agency.

Trying to separate science from law, as we have tried to do for so long, is self-defeating. Science and policy are inextricably linked and should be. We need the mechanisms by which to let both areas of expertise inform but not confuse or corrupt the way we make policy. We want to guard against regulatory capture while, at the same time, harnessing collective expertise to advance the public interest. "If told that it is improper to make policy recommendations, scientific groups are much more likely to smuggle in their policy predilections covertly, either consciously or unconsciously. We would be far better advised to invite scientific advisory bodies to separate their scientific conclusions from their policy recommendations, and to empower them to address both."¹⁵⁶

The way to do this is by opening the process.

¹⁵⁵ DAVID SCHOENBROD, *SAVING OUR ENVIRONMENT FROM WASHINGTON* 210 (2005) (quoting E. Donald Elliott, former EPA general counsel).

¹⁵⁶ E. Donald Elliott, *Strengthening Science's Voice at the EPA*, 66 L. & Contemp. Probs. 45, 58-59 (2003).

David Schoenbrod tells of an example where scientists and physicians ripped to shreds the EPA's report on lead pollution that suggested levels of lead pollution were safe.¹⁵⁷ The report did not comport with scientific fact. Open review creates a way to address whether something is technologically feasible as a matter of scientific fact (which may be a different question from whether it is economically prudent).¹⁵⁸ It lets the patent examiner know if there is, in fact, a similar invention already invented or if his assessment of whether a particular substitution of compound X for compound Y is really not obvious.

But open review not only makes more science available, it can reveal debates over that information. "Good science is a chorus of independent expert voices that come together with sufficient coherence and force to constrain policy, structure debate, and influence policy. Rarely does good science dictate a unique policy outcome; more often, it structures a policy dialogue among different disciplines and constituencies by defining a problem and a range of options, but it may also figure in the decision of which options to adopt."¹⁵⁹ A more open and deliberative dialogue about science eliminates the concerns to which closed peer review is prone, namely the fear that there may not be scientific consensus around an issue. When we discuss whether an innovation is truly novel and non-obvious, there may be disagreement. Airing that disagreement is helpful to the process and informs how the examiner should proceed – how much time to invest and the course to adopt – in doing his work.

¹⁵⁷ DAVID SCHOENBROD, *SAVING OUR ENVIRONMENT FROM WASHINGTON* 32 (2005).

¹⁵⁸ DAVID SCHOENBROD, *SAVING OUR ENVIRONMENT FROM WASHINGTON* 40 (2005).

¹⁵⁹ E. Donald Elliott, *Strengthening Science's Voice at the EPA*, 66 *L. & Contemp. Probs.* 45, 46 (2003).

This is also way to challenge bad science much earlier in the process without having to wait for litigation.¹⁶⁰ Reform proposals abound¹⁶¹ to change the standard of judicial review for granted patents as well as for agency determinations based on science.¹⁶² Scholars and practitioners have recognized the problems that arise with *Chevron*-deference to agency decision-making.¹⁶³ While this does not substitute for such reforms, open review does provide an additional check – and one more expert than the courts – of the work of agencies.

Open review has another benefit that goes beyond the immediate process of patent examination. It promotes deliberation around issues of national importance. "Such deliberation can lead individuals to revise opinions (about both facts and values), alter premises, and discover common interests. Disagreements and inconsistencies encourage individuals to balance and rank their wants. The discovery that solely personal concerns are shared empowers

¹⁶⁰ See, e.g. Joseph Farrell and Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 BERK. TECH. L. J. (2004).

¹⁶¹ See, e.g., Mark A. Lemley, Douglas Lichtman and Bhaven Sampat, *What to Do about Bad Patents?*, 28 REGULATION 10-13 (2005-6) (proposing 1) weakening the presumption of validity, 2) allowing legitimate inventors to earn a presumption of validity and "gold-plating" their patents by paying for more thorough searches, and 2) instituting post-grant opposition, "a process by which parties other than the applicant would have the opportunity to request and fund a thorough examination of a recently issued patent.").

¹⁶² For a discussion of a wide variety of reform proposals, see Matthew Sag and Kurt Rohde, *A Differential Impact Analysis of Patent Reform* (draft dated Aug 12, 2006) (analyzing patent reform proposals through differential impact analysis), available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers2/sag.doc>. See also Brendan Chase, *IBM Calls for Patent Reform*, ZDNET, AUSTRALIA, 11 April 2005, available at <http://www.zdnet.com.au/news/0,39023165,39187609,00.htm>.

¹⁶³ *Chevron U. S. A. V. Natural Resources Defense Council, et al.*, 467 U.S. 837 (1984) ("We have long recognized that considerable weight should be accorded to an executive department's construction of a statutory scheme it is entrusted to administer, and the principle of deference to administrative interpretations "has been consistently followed by this Court whenever decision as to the meaning or reach of a statute has involved reconciling conflicting policies, and a full understanding of the force of the statutory policy in the given situation has depended upon more than ordinary knowledge respecting the matters subjected to agency regulations.")

people to act upon them. Thus, public deliberation helps transform individual valuations into social values; it helps forge collective purposes, and, even more important, helps define and refine public morality. Through such deliberations, individuals become *citizens*."¹⁶⁴ Engaging the entire scientific community in legal decision-making that is affected by science, promotes science education and literacy.¹⁶⁵ On the one hand, this benefits science and advances its role in our society. On the other hand, it puts scientific knowledge to work for larger public purposes by involving the public in peer review. This democratizes the conversation about science, promotes deliberation about issues of scientific understanding and advances the goals of democratic participation.

This open process obviously increases oversight over the regulatory process by another institution in addition to Congress and the courts. It allows the public not only to vet but also to produce the information on which regulatory decisions are based. In the case of patent examination, this is essential. The centralized examiner does not have access to the requisite information or know-how to make informed decisions. Open review could be used, not only to help the federal bureaucrat do his work, but also to provide the mechanism by which to coordinate more regional processes of decision-making and feedback and to spur a conversation across levels of government.

Finally, open review is at once both more expert and more participatory than peer review. It opens up the policymaking process to more members of the scientific community and provides the platform by which to organize and

¹⁶⁴ Robert Reich, *Public Administration and Public Deliberation: An Interpretive Essay*, 94 YALE L.J. 1617, 1631-2 (1985); also Beth Simone Noveck, *Designing Deliberative Democracy in Cyberspace: The Role of the Cyber--Lawyer*, 9 B.U. J. SCI. & TECH. L. 1 (2003).

¹⁶⁵ PHILIP KITCHNER, SCIENCE, TRUTH AND DEMOCRACY 142 (2001).

evaluate their input. This suggests a way forward that balances expertise with accountability, science with democracy.

The incentives are clear and powerful. Still, we anticipate critiques and questions about such a revolutionary proposal to which this Section must respond:

This proposal is too radical. How can we put the fate of innovators and national competitiveness in the hands of the public?

The peer to patent system does not eliminate the Patent Office nor does it alter the substantive, statutory standards we use for reviewing inventions. It preserves the same scheme we have had in place since 1952.¹⁶⁶ It merely combines with that system the "radical" invention of the jury that we have used since the 12th century and which we zealously guard as a non-expert institution.¹⁶⁷ Furthermore, this is not merely public participation but participation by mutually self-rating experts committed to a minimum level of participation. We rely on such mechanisms for selecting Academy Awards and Nobel Prizes. We even use them in government, such as the National Science Foundation which claims to operate from the "bottom up," using peer experts to keep track of research "around the United States and the world, maintaining constant contact with the research community to identify ever-moving horizons

¹⁶⁶ Patent Act of 1952, as amended, 35 U.S.C. 1 et seq. (1994).

¹⁶⁷ The Magna Carta of 1215 contains the genesis of the modern jury system. *See, e.g.,* MAXIMUS LESSER, THE HISTORICAL DEVELOPMENT OF THE JURY SYSTEM (1894).

of inquiry, monitoring which areas are most likely to result in spectacular progress and choosing the most promising people to conduct the research."¹⁶⁸

Participants will game the system. How can you ensure that people with conflicts of interest won't place speed bumps and stumbling blocks in the path of their competitors?

Absolutely! Competition will drive more information into the process. So long as people make valid arguments as rated by their peers, their personal agenda is irrelevant. Having many participants in the process dilutes the effect of any bad apples or unconstructive participants. Within any social reputation system, norms evolve to safeguard the quality of participation and we can expect something similar here. It is also standard and unproblematic to require participants to sign an affidavit representing that they do not have a conflict of interest. The affidavit can include a disclosure of the expert's last two employers and areas of current commercial research. Direct competitors might be prevented from rating a particular invention. The National Science Foundation, the National Research Council and the National Institutes of Health both have well-established regulations and disclosure requirements to weed out conflicts among peer-review participants.¹⁶⁹

¹⁶⁸ National Science Foundation, How We Work (Jul 15, 2005) at <http://www.nsf.gov/about/how.jsp> (last visited Sept. 30, 2005).

¹⁶⁹ See, e.g., The National Academies Press, Peer Review in Environmental Technology Development Programs, <http://www.nap.edu/books/0309063388/html> (follow "Executive Summary" hyperlink) (last visited September 30, 2005) (A peer is "a person having technical expertise in the subject matter to be reviewed (or a subset of the subject matter to be reviewed) to a degree at least equivalent to that needed for the original work.").

Giving decision-making authority to non-governmental persons degrades impartiality in the system. Wouldn't this be a violation of the non-delegation doctrine prohibiting delegation of authority to unauthorized bodies?

You couldn't have more discretion than what is currently exercised now by the lone patent examiner who rules on innovation without significant oversight or review. The "wisdom of the crowd" is more accurate and more objective than the judgment of one, uninformed so-called expert.¹⁷⁰ At the same time, ultimate decision-making authority continues to rest with the Patent Office and courts will still fulfill the function of judicial review. Under Chevron,¹⁷¹ agencies have the right to consult and solicit outside information. Under the Administrative Procedure Act¹⁷² agencies are required to solicit outside information from the public when conducting informal rulemaking.

Competitors will steal information and use this system to misappropriate confidential business information. How do we ensure that this doesn't become a hunting ground for foreign competitors to pillage American innovation?

¹⁷⁰ JAMES SUROWIECKI, THE WISDOM OF CROWDS (2004).

¹⁷¹ Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837, 843 (1984) ("If Congress has explicitly left a gap for the agency to fill, there is an express delegation of authority to the agency to elucidate a specific provision of the statute by regulation. Such legislative regulations are given controlling weight unless they are arbitrary, capricious, or manifestly contrary to the statute. Sometimes the legislative delegation to an agency on a particular question is implicit rather than explicit. In such a case, a court may not substitute its own construction of a statutory provision for a reasonable interpretation made by the administrator of an agency.")

¹⁷² The Administrative Procedure Act ("APA"), 5 U.S.C. § 553 (provides that legislative or substantive rules must be preceded by public notice and an opportunity for public comment).

At present, patents are published after 18 months, whether or not they have been granted.¹⁷³ The presumption in our system (and every other patent system) is in favor of information disclosure. As the Supreme Court has stated, "[T]he pressure for secrecy is easily exaggerated, for if the inventor of a process cannot himself ascertain a "use" for that which his process yields, he has every incentive to make his invention known to those able to do so. Finally, how likely is disclosure of a patented process to spur research by others into the uses to which the product may be put? To the extent that the patentee has power to enforce his patent, there is little incentive for others to undertake a search for uses."¹⁷⁴ The inventor is taking some risk by disclosing but that risk is that of foregoing trade secret protection, nothing more. This is a small cost to impose on the inventor for the cost imposed on the public from the patent monopoly. If the patentee does not want to forego secrecy or does not feel that the patent is meritorious enough to receive protection, he should not be filing for a patent. Since patent protection applies retroactively to the date of invention (or filing in the case of other jurisdictions), the inventor will be able to pursue anyone who misuses information learned in the process. If and when the patentee receives the patent, he then has the right to go after those who abused the process with a big stick. We can imagine enacting statutory treble damages and other penalties for

¹⁷³ 37 CFR 1.211 (2005). Publication is required for most non-provisional applications (other than for a design patent filed under 35 U.S.C. 171 and reissue applications filed under 35 U.S.C. 251) filed on or after November 29, 2000. Exceptions to publication are set forth in 35 U.S.C. 122(b)(2) and 37 CFR 1.211. An applicant may find publication of an application to be a desirable alternative to requesting a SIR since publication of the application is achieved without any waiver of patent rights. See MPEP § 1120 et seq. for more information pertaining to the eighteen month publication rule.

¹⁷⁴ *Brenner v. Mason*, 383 U.S. 519, 534 (1966).

those who would abuse information learned during the process. The peer to patent system speeds up the disclosure and helps to realize the bargain between the inventor and the public to make information about the invention public.

Inventions will be excessively scrutinized. Won't the level of patenting decrease?

Hopefully, yes. We grant too many patents already.

Since it is scientists, innovators and inventors who themselves rely on patents participating in the system, there is not an undue incentive for *Schadenfreude* and defeating every patent.

This system might also be used as a way for the community to award prizes and accolades for particularly meritorious inventions. A Community Patent Prize could become a lucrative and coveted prize to be won.

There are too many patents. Won't the workload be too great for non-professional participants?

We are not asking lay persons to be patent examiner, just to be scientists or innovators. The expert already knows the answer. It is easy for him to identify prior art. It is simple for him to assess how innovative and non-obvious and invention is. He is familiar enough with the subject matter to assess whether it has been enabled. If we optimize the design of the system to "chunk" the work into minimal participation then each patent only requires a short time to review. The novelty and prior art review is deliberately designed to be a quick process

with many participants. Furthermore, there are plenty of scientists, engineers, economists, consultants and other professionals eligible to participate. If NSF can tap over 50,000 natural scientists to review grant applications, the patent office should be able to solicit the participation of a vastly wider network of experts. Finally, this is only a pilot with 250-400 applications.

There will be procedural hurdles. Would the Federal Advisory Committee Act (FACA) prohibit Peer to Patent?

FACA was enacted¹⁷⁵ to protect against closed-door cabals¹⁷⁶ leading to regulatory capture. But all information in the peer to patent system will be open, on-line and available. With an increase in the use of juries ex post to review patent validity in infringement cases, why not use juries a priori? We are simply moving up the jury review in the process but without imposing any added cost on the investor for that review. If this constitutes a contravention of FACA, we'll amend FACA.

What about Patent Law? Won't participating in Community Peer Review run the risk of increasing liability for willful infringement?

¹⁷⁵ Federal Advisory Committee Act, 5 U.S.C. App. 1, Pub. L. 92-463, Oct. 6, 1972.

¹⁷⁶ Public Citizen v. U.S. Dept. of Justice, 491 U.S. 440, 442 (1989) (legislative history shows that Congress sought only to endorse compliance with FACA's more stringent requirements by advisory committees already covered by Order and Presidential advisory committees, and that the statute's "or utilized" phrase was intended to clarify that FACA applies to committees "established . . . by" the Government in a generous sense of that term, encompassing groups formed indirectly by quasi-public organizations "for" public agencies as well as "by" such agencies themselves).

A defendant may be held liable for damages for willful infringement if he/she: (a) knew of the patent; (b) deliberately copied the ideas or designs of another; and (c) failed to affirmatively exercise due care, which may include the duty to seek competent legal advice before engaging in any activity that may result in infringement.¹⁷⁷ But participation in the pilot, by contributing prior art, without more, does not give rise to willfulness which pertains to infringement of a granted and issued patent not, as in this case, a published application.

Won't Peer to Patent decrease certainty and stability in the system?

To the contrary, patents that undergo this process will be much less likely to be challenged subsequently because more experts will have vetted them. If successful, Community Patent Review should translate into a presumption of validity and incontestability. This reduces the risk of legal challenge and the burden to innovation from enormous patent damage awards.¹⁷⁸

Rational ignorance is intentionally built into the patent system. According to Mark Lemley, since most patents are never litigated or even licensed, spending too much time and money on initial review is a waste and "decisions can be made much more efficiently in litigation." Why invest in process review?

¹⁷⁷ *Chaparral Industries, Inc. v. Boman Industries, Inc.*, 697 F.Supp 1113, 1124 (1988); *Vulcan Eng'g Co. v. FATA Aluminum, Inc.*, 278 F.3d 1366, 1378 (2002). See also, Yeen Tham, Memorandum on Willful Infringement and Community Patent Review, available at <http://dotank.nyls.edu/communitypatent>.

¹⁷⁸ Patent Reform Act of 2005, H.R.2795, 109th Cong. (2005) (among other reforms the Patent Reform Act of 2005 would limit damages to the inventive contribution rather than calculating damages on the selling price of an entire product; it would limit damages for willfulness).

When Lemley wrote this¹⁷⁹ he contemplated the choice between imposing the cost on inventors upfront or after the fact and deemed it more cost effective to impose the costs of review on those who are invested enough in their patents to justify litigation. But it is no longer a choice between imposing costs on those seeking to litigate versus prosecute. The Community Peer review system does not impose any additional cost burden on the Patent Office or the inventor and, at the same time, it reduces the costs of litigation. It also does not impose the costs of an inter partes interference proceeding,¹⁸⁰ which must be borne by the inventor. Lemley does not measure the significant costs and chilling effects that the overhang of uncertain patents subject to challenge creates in the industry. Furthermore, it ignores the Supreme Court's clear statement that "primary responsibility for sifting out unpatentable material lies in the patent office. To await litigation is - for all practical purposes - to debilitate the patent system."¹⁸¹

Isn't there a lack of incentive to participate?

¹⁷⁹ Mark Lemley, *Rational Ignorance at the Patent Office*, UC BERKELEY LAW SCHOOL RESEARCH PAPER No. 46, 95 NW. U. L. Rev. 1495 (2001) ("The strong implication of these numbers is that society ought to resign itself to the fact that bad patents will issue, and attempt to deal with the problem ex post, when the patent is asserted in litigation. This result is admittedly counterintuitive. It depends crucially on the fact that very few patents are ever the subject of litigation, or even licensing. Because of this, money spent improving the PTO examination procedures will largely be wasted on examining the ninety-five percent of patents that will either never be used, or will be used in circumstances that don't crucially rely on the determination of validity").

¹⁸⁰ Inter Partes Proceeding 37 C.F.R. § 2609.

¹⁸¹ *Graham v. John Deere Co.*, 379 U.S. 956, 85 S. Ct. 652 (1965)

To the contrary, in the patenting process the stakes are high and self-interest will motivate participation. For many the desire to ensure that unpatentable subject matter in their area of art does not pass muster, will further motivate involvement. We will build these incentives for participation into the system. First, the social reputation software creates an incentive to join the network of experts. We appeal to expertise and professionalism to induce participation. Second, the system "chunks" the work so that assignments are modular and participation can be accomplished without an undue imposition on time. Third, more participation creates a feedback score which increases one's standing in the community that is beneficial when the participant himself becomes an inventor filing for a patent. Standing in the community can only encourage serious and focused review by other members of the group. Finally, corporate managers have an incentive to encourage participation to learn more about the state of the art in the industry and to raise the standing of its scientists and experts in the innovation process.

There will be too few participants. How will you recruit?

By focusing the pilot on Technology Center 2100, we concentrate our work on software-related patents. There is large community of software developers with a strong spirit of voluntarism. Furthermore, there are many within that community who oppose patenting and will want to participate in an effort to defeat bad patents. In addition, those volunteering patents to be peer reviewed, including IBM and Microsoft have already also committed to have

employees participate as peer reviewers. Patent applicants, more broadly, will be invited to participate. The peer to patent system will also solicit participation from large industry, universities, and academic tech transfer offices. Interest groups and industry media can also be used to recruit participants. Upper level graduate students will want to participate to raise their standing and become known in their communities of practice.

We will tap into existing networks of scientific collaboration and expertise.¹⁸² For the same reasons that many people create the 18 million blogs currently on-line in the United States, namely to put their name out there as the "go-to" person on a given industry and issue, experts from a wide array of innovating professions will want to participate in this network.

It will be hard to coordinate all these people. How will it be managed?

Yes, coordination is hard which is why we need a well-designed system that allows participants to see clearly the community of which they are a part, to understand their role within the group, to participate simply and easily in the process and to see the outcome. If eBay can coordinate a million¹⁸³ auctions each year, then this system can be built.

¹⁸² see, e.g. M. E. J. Newman, *Who Is The Best Connected Scientist? A Study Of Scientific Coauthorship Networks*, in COMPLEX NETWORKS, E. Ben-Naim, H. Frauenfelder, and Z. Toroczkai (eds.), 337-370 (2004); M.E.J. Newman, *Coauthorship Networks And Patterns Of Scientific Collaboration*, PROC. NATL. ACAD. SCI. USA 101, 5200-5205 (2004).

¹⁸³ eBay: *The Company at* <http://pages.ebay.com/aboutebay/thecompany/companyoverview.html> (last visited September 30, 2005) (EBay has 100 million registered users).

Doesn't big business stand to lose from this process? Won't it want to preserve the status quo?

Even the biggest patent holders like IBM recognize the desperate need for patent reform. No one wins when patent grants become meaningless, uncertain and subject to expensive legal challenges. The largest companies with the deepest pockets are the ripest targets for patent trolls.

Don't small inventors stand to suffer from this process?

Small inventions get equal consideration in this system and the work of even unknown inventors get brought to the fore. With large numbers of eyeballs reviewing prior art, there is minimal risk of large players "stacking" the deck and rigging the jury. With a wide-ranging review system, we increase competition among the players and improve quality for everyone. We already have two small companies who have volunteered participation prior to the public launch: International Characters and Out-of-the-Box Computing.

Should we pay people to participate in the process?

While we can imagine using the system to generate revenue from patent licenses that can be redistributed back to the examiners, this conservative proposal does not propose to "corrupt" the peer review process with payments. The idea is to create more not less impartiality. We can imagine using the

process to set aside downstream revenues to benefit social causes and develop a market in venture philanthropy where companies dedicate a portion of proceeds or licenses to civic and developing world causes. But at this stage no funds will change hands and the system will be free and open.

Can this process be privatized? Could a consortium of companies run this system? Can we "do patents" with contract law?

Yes and no. The "peer to patent" system addresses how to reform bureaucratic expertise and get more information to the Patent Office in a manageable way. A peer review process will be most effective and create the greatest incentive to participate if it is tied directly into the legal system. At the same time, private third parties are already offering services to discuss and deliberate about granted (and increasingly about published) patents. Eventually, we will aim to act as a conduit by setting standards by which this third-party data can be channeled to the Patent Office.

If we change the process what happens to the prosecution history and file wrapper estoppel? How will a record be created for appeal?

The peer to patent process is far more transparent than what exists currently. With the entire process conducted online, it will be recorded and archived in entirety. We will be better able to see the reasoning that went into a patent determination. This creates a stronger, more robust and more informed

record for review. We will have to make rules about which portions of the peer review process form part of the prosecution history. But it can and should be archived and stored as one would any electronic legal record.

Public criticism of the invention will depress the price. Won't this system shine too much light on an invention and hurt the market for innovation?

Only for unqualified inventions undeserving of a patent will this depress the price but not necessarily dry up the market. It should significantly increase the price for successful inventions because these inventions will, effectively, be endorsed by a community of experts.

This doesn't solve the problem of AIDS drugs in Africa or reduce the cost of Cipro when Anthrax breaks out, does it?

No, it doesn't. We still need the reform-minded proposals like those of Jamie Love at the Consumer Project on Technology, for example, who is proposing to create a fund to compensate innovators when they bring new pharmaceuticals to the market to encourage the donation of those drugs to the public domain.

At the same time, the peer to patent system pushes the conversation about invention and innovation to the forefront and makes more information available to the social activist community interested in these issues.

Doesn't this system diverge from international norms? What about comity?

The European, Japanese and other patent offices should ideally, run parallel pilot implementations of peer to patent to reform the patent system worldwide and to generate more information about scientific innovation while, at the same time, building the community of scientific experts. If we are going to change the world, we must start at home!

Conclusion: Institutional Competence and Patent Reform

Neither the Patent Reform Act of 2005 nor the Patents Depend on Quality Act of 2006 has passed. While the Supreme Court heard several patent appeals this year, it changed its mind and overturned its own grant of certiorari in *LabCorp v. Metabolite* as improvidently granted.¹⁸⁴ Had it moved forward, this case would have gone to the central question of the scope of patentable subject matter.¹⁸⁵ Patent reform has been incremental at best with no major changes to the system since the Patent Act was enacted in 1952. Open peer review presents an alternative avenue for legal reform by enhancing the institutional competence of the Patent Office. It focuses on the institution that makes the decisions and employs the new communications practices that technology makes possible to improve its work. Instead of seeking reform through the slower mechanism of

¹⁸⁴ 584 U.S. ____ (2006).

¹⁸⁵ A number of scholars have called for urgent reform of the scope of patentable subject matter and have despaired of its failure to be enacted. For examples of the most recent scholarship, see, Kevin Emerson Collins, *Propertizing Thought* (2006); Eileen Kane, *The Dormancy and Revival of the Patentable Subject Matter Doctrine* (2006); Sean M. O'Connor, *Using Science & Technology Studies to Redefine Patentable Subject Matter under the Progress Clause of the Constitution* (2006). These unpublished papers are available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/schedule.html>.

judicial review,¹⁸⁶ this proposal addresses its administrative law antecedents by revolutionizing the process of patent examination itself.¹⁸⁷

This not only precipitates a rethinking of administrative reform, generally, it demonstrates that it is possible to improve decision-making by enhancing the informational inputs into the process. Even were we to change the legislative standards by which patent determinations are made, without adequate information to enable a decision about what is novel and non-obvious, reform is not possible. Agencies depend on good information to do their work – whether it is determining patents or air quality – and they lack the institutional mechanisms and the institutional culture to benefit from outside expertise.

Focusing on the Patent Office qua agency not only shifts the discourse of reform to administrative practices, it makes the case for empirical and data-

¹⁸⁶ *cf.*, Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1510 (2001) (arguing that because most patents are not of tremendous value, reform should be ex post rather than ex ante) (“The strong implication of these numbers is that society ought to resign itself to the fact that bad patents will issue, and attempt to deal with the problem ex post, when the patent is asserted in litigation. This result is admittedly counterintuitive. It depends crucially on the fact that very few patents are ever the subject of litigation, or even licensing. Because of this, money spent improving the PTO examination procedures will largely be wasted on examining the ninety-five percent of patents that will either never be used, or will be used in circumstances that don’t crucially rely on the determination of validity”).

¹⁸⁷ See, e.g., Matthew Sag and Kurt Rohde, A Differential Impact Analysis of Patent Reform, Section B.1, p. 11ff (draft dated Aug 12, 2006) (focusing on examination related reforms and discussing both this reform proposal and other patent office initiatives such as limiting the applicant’s right to file continuations, streamlining examination by requiring applicants to designate representative claims, changing the rules relating to prior art search by applicants and their Information Disclosure Statements and offering an avenue for “accelerated review”), available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers2/sag.doc>. The Patent Office has catalogued its proposed rule changes online at: Proposed Rule Changes to Focus the Patent Office in the 21st Century, available at <http://www.uspto.gov/web/offices/pac/dapp/opla/presentation/focuspp.html> (last visited Aug. 17, 2006).

driven reform.¹⁸⁸ The legal profession often prefers "anecdotes to tables"¹⁸⁹ and, with notable exceptions, there is a lack of empirical scholarship to support legislative change.¹⁹⁰ By designing and implementing a pilot to change workplace procedures, we can test the impact on the patent system. We can ascertain if such measures promote the progress of the useful arts. Rather than content ourselves with guesswork as to what legal reforms will address the patent crisis – wondering whether changing the standard of judicial review or reforming the obviousness standard will, in fact, improve patent quality -- open patent review will allow us to demonstrate reform in practice by means of defined metrics. We can inject more information into the process to inform examination and test the results. We can then lobby Congress for more thoroughgoing legislative change on the basis of concrete data as to what works

¹⁸⁸ David A. Hyman, *An Outsider Perspective on Intellectual Property Discourse*, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 276, 278 (F. Scott Kieff, ed.) (2003) (discussing evident lack of concern about the dearth of empirical evidence in legal scholarship); see also Jack Goldsmith and Adrian Vermeule, *Empirical Methodology and legal Scholarship*, 69 U. CHI. L. REV. 153 (2002); Richard Revesz, *A Defense of Empirical Legal Scholarship*, 69 U. CHI. L. REV. 169 (2002).

¹⁸⁹ David A. Hyman, *An Outsider Perspective on Intellectual Property Discourse*, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 279 (F. Scott Kieff, ed.) (2003).

¹⁹⁰ For some of this recent empirical legal scholarship about intellectual property, see Barton Beebe, *An Empirical Study of the U.S. Copyright Fair Use Cases* (2006), available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers2/Beebe.pdf>; William T. Gallagher, *Strategic Intellectual Property Litigation: An Empirical Study of Enforcement of Intellectual Property Claims*, available at <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers/Gallagher.doc>; Paul Heald, *Copyright Ownership and Efficient Exploitation: An Empirical Study of American Works*, <http://www.law.berkeley.edu/institutes/bclt/ipsc/papers/Heald.doc>; Gregory Mandel, *Patently Non-Obvious, Patently Non-Obvious: How the Hindsight Bias Renders Patent Decisions Irrational* (2006); Lee Petherbridge and R. Polk Wagner, *The Federal Circuit and Patentability: An Empirical Assessment for the Law of Obviousness* (2006), http://www.law.upenn.edu/polk/petherbridge_obviousness.pdf. See also Mark A. Lemley and Carl Shapiro, *Patent Holdup and Royalty Stacking* (July 12, 2006). Stanford Law and Economics Olin Working Paper No. 324 Available at SSRN: <http://ssrn.com/abstract=923468>.

and what does not work. Gathering data through empirical research shows how we might conduct public participation and develop new models and new technologies to solicit public, more specifically expert, input to improve regulatory decision-making.

The new type of digital institution, for which this Article argues, combines scientific and legal decision-making using online tools to improve the quality of patent examination. Instead of one examiner, an application can have 1000! If we do so, the new generation of social software that enables commons-based production might not simply make it easier to get a date or find new bands, it could bring about a better, fairer form of governmental decision-making for patents and improve upon the constitutional promise to promote the progress of science and the useful arts in our democracy by ensuring that only worthy ideas receive that odious monopoly of which the first patent examiner, Thomas Jefferson, complained.¹⁹¹

¹⁹¹ Along the same lines, Irving Wladawsky-Berger, IBM Vice President of Technology and Strategy said, "Through the U.S. Patent Office any idiot can get a patent for something that should never be granted a patent." INFOWORLD March 7, 2005.