

**“PEER TO PATENT”:
COLLECTIVE INTELLIGENCE, OPEN REVIEW, AND PATENT
REFORM**

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I. INTRODUCTION

There is a crisis of patent quality. Patents are being issued that are vague and overbroad, lack novelty, and fail the constitutional mandate “[t]o promote the Progress of Science and useful Arts.”¹ Low quality patents generate excessive litigation and confer the economic rewards of monopoly on patent holders while providing little benefit to the public.²

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1. U.S. CONST. art. I, § 8, cl. 8.

2. See A PATENT SYSTEM FOR THE 21ST CENTURY 46 (Stephen A. Merrill et al. eds., 2004); see also ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS 1–8 (2004) (arguing that recent changes in the patent system have resulted in increased litigation and a greater threat of litigation, creating a net social loss); Shubha Ghosh & Jay Kesan, *What Do Patents Purchase? In Search of Optimal Ignorance in the Patent Office*, 40 Hous. L. Rev. 1219, 1227–35 (2004) (discussing the social costs of low quality patents); Editorial, *The Problem with Patents*, WALL ST. J., Mar. 29, 2006, at A18 (“If bad or dubious patents pro-

This paper argues that access to information is the crux of the patent quality problem. Patent examiners currently make decisions about the grant of a patent that will shape an industry for a twenty-year period³ on the basis of a limited subset of available information. Examiners may neither consult the public, talk to experts, nor, in many cases, even use the Internet.⁴ Furthermore, applicants often fail to draft clear applications; they are not obligated to supply the patent examiner with information necessary to make an informed decision.⁵ The burden falls on the United States Patent and Trademark Office (“USPTO”), whose employees must search for and find the relevant technological antecedents, known as “prior art,” against which they compare and assess the claimed invention.⁶

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 [sic] professors, and a previous refusal of a patent would better guard our citizens against harassments by lawsuits.”⁷ Indeed, Jefferson, the first patent examiner, consulted with Joseph Hutchinson, Professor of Chemistry at the University of Pennsylvania, to seek his advice before issuing a patent on an alchemical process.⁸

By contrast, today’s patent system replaces expert “academical” input with a centralized and isolated expert-bureaucrat evaluating applications on the basis of a legal fiction — from the viewpoint of the “Person Having Ordinary Skill in the Art” (“PHOSITA”).⁹ These patent examiners are underpaid¹⁰ and overworked.¹¹ They labor inde-

liferate, they can have the opposite of their intended effect, which is to promote and reward innovation.”).

3. 35 U.S.C. § 154(a)(2) (2000).

4. See UNITED STATES PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURES § 904.02(c) (8th ed. 2001) [hereinafter MPEP].

5. See Lee Petherbridge, *Positive Examination*, 46 IDEA 173, 182–83 (2006).

6. See *id.* (arguing for a reduction in the information costs assumed by the USPTO).

7. E.C. Walterscheid, *Thomas Jefferson and the Patent Act of 1793*, 40 ESSAYS IN HIST. (1998), <http://etext.virginia.edu/journals/EH/EH40/walter40.html> (quoting Letter from James Rumsey to Thomas Jefferson (June 6, 1789), in 15 THE PAPERS OF THOMAS JEFFERSON, 171 (John Catanzariti et al. eds., 1990)).

8. See Letter from Thomas Jefferson to James Hutchinson (Mar. 12, 1791), in 19 THE PAPERS OF THOMAS JEFFERSON, 614 (Julian P. Boyd ed., 1974) (consulting with a professor of chemistry in connection with a patent on a desalination process).

9. 35 U.S.C. § 103(a) (2000); see Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885, 886 (2004) (“[The language of § 103] seems to call for evaluations of nonobviousness from the perspective of ordinary practitioners who are contemporaries of the inventor in the relevant technological community.”).

10. 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 USPTO, a patent examiner generally starts at levels between GS-5 to GS-9, where the salary is between \$35,273 and \$66,011, and can be promoted to GS-14, with a maximum salary of \$122,367. USPTO: FAQs, Question 17, <http://www.usptocareers.gov/faq.asp> (last visited Oct. 7, 2006); USPTO Specialty Salary Rate Table, <http://www.usptocareers.gov/salaryrates.asp> (last visited Oct. 7, 2006). Entry level salaries for first-year associates in large New York law firms are approximately

pendently under a backlog approaching one million applications,¹² with no more than eighteen to twenty hours to review each one.¹³ There is an absence of communication with the scientific community, and examiners are not required to have advanced degrees in the sciences.¹⁴ With increasing automation, examiners have less need, and hence limited opportunity, to communicate with each other directly, resulting in a growing information deficit.

Rejecting input from experts and remaining unaccountable to the scientific community produces problems with information quality and transparency at the USPTO. The institutionalized isolation of 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 procedural expertise and decision-making. This distrust of outside knowledge is compounded by an inability to effectively and efficiently engage experts. Thus, the patent quality problem is, at least in part, a problem of information access.¹⁵

This dearth of information — striking in view of the explosion of informational resources created by the Internet age — cannot be solved through judicial review. At present, even though an overwhelming percentage of patent applications are granted (with some estimates as high as ninety-seven percent),¹⁶ patent owners enjoy a

\$145,000. See Ellen Rosen, *For New Lawyers, the Going Rate Has Gone Up*, N.Y. TIMES, Sept. 1, 2006, at C7.

11. The USPTO has the same number of examiners yet twice the number of applications as the European Patent Office. See JAFFE & LERNER, *supra* note 2, at 131.

12. At the end of 2005, the number of pending patent applications was 885,002 and rising. See USPTO, PERFORMANCE AND ACCOUNTABILITY REPORT 120 tbl.3 (2005) [hereinafter ANNUAL REPORT], available at <http://www.uspto.gov/web/offices/com/annual/2005/2005annualreport.pdf>; see also *Review of U.S. Patent and Trademark Office Operations, Including Analysis of Government Accountability Office, Inspector General, and National Academy of Public Administration Reports: Hearing Before the Subcomm. on Courts, the Internet, and Intell. Prop. of the H. Comm. on the Judiciary*, 109th Cong. 14 (2005) (statement of Jon W. Dudas, Under Secretary of Commerce for Intellectual Property; Director, USPTO) (“[W]ithout 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.”).

13. See U.S. GOV’T. ACCOUNTABILITY OFFICE, GAO-05-720, INTELLECTUAL PROPERTY: USPTO HAS MADE PROGRESS IN HIRING EXAMINERS, BUT CHALLENGES TO RETENTION REMAIN 28 (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.”); Kevin Maney, *Patent Applications So Abundant that Examiners Can’t Catch Up*, USA TODAY, Sept. 21, 2005, at 3B.

14. “[A] degree from an accredited college or university in Electrical Engineering, Computer Engineering, Computer Science, Mechanical Engineering, Chemical Engineering, Material Science Engineering, Biology, [or] Organic Chemistry” will allow an individual to become a patent examiner. USPTO: FAQs, *supra* note 10.

15. See Petherbridge, *supra* note 5, at 178 (“[T]ransactions involving questionable patents . . . can be productively considered as problems of information costs and information cost allocation.”); see also Clarisa Long, *Information Costs in Patent and Copyright*, 90 VA. L. REV. 465 (2004).

16. See Cecil D. Quillen et al., *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office — Extended*, 12 FED. CIR. B.J. 35, 36 (2002); see also

presumption of validity. The Federal Circuit, the specialty patent appeals court, rules in favor of patent holders more often than not in infringement actions.¹⁷ Yet contrary to prevailing theory, “Daubertizing”¹⁸ agency decision-making by lowering the current standard of judicial review over USPTO decisions is too slow, too irregular, and too late in the game to solve the problem,¹⁹ especially as judicial review cannot occur until examination concludes, which can take several years.²⁰

Other reform proposals are also inadequate. Those that call for ex post solutions, such as post-grant administrative review to “gold-plate” important patents,²¹ require improved mechanisms for accessing the information necessary to make the patentability determination. Similarly, proposals to change the statutory standards of patent examination, revisit the scope of patentable subject matter, or modify the definition of obviousness do not eliminate the need to address the information deficit. They also require extraordinary political capital to move through Congress. Even regulatory proposals that require applicants to search more thoroughly for the prior art still require significant political support and assume that applicants, including small inventors, have the ability to find all the relevant information.

Patently-O, http://www.patentlyo.com/patent/articles_and_publications/index.html (Aug. 26, 2004).

17. See John R. Allison & Mark A. Lemley, *How Federal Circuit Judges Vote in Patent Validity Cases*, 27 FLA. ST. U. L. REV. 745, 754 (2000) (“Judges appointed after 1982 voted to hold a patent valid 164 times out of 298, or 55.0% of the time.”); see also Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 26–30 (1989); but see Donald R. Dunner, *The United States Court of Appeals for the Federal Circuit: Its First Three Years*, 13 AIPLA Q.J. 185, 186 (1985) (“[W]hat [the results] show is anything but a bias in favor of patents — either from a validity or an infringement standpoint.”). 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 BERKELEY TECH. L.J. 1155, 1156 (2002).

18. See Alan Charles Raul & Julie Zampa Dwyer, “Regulatory Daubert”: *A Proposal to Enhance Judicial Review of Agency Science by Incorporating Daubert Principles into Administrative Law*, 66 LAW & CONTEMP. PROBS. 7 (2003) (arguing that the principles of *Daubert* should be applied to administrative agencies “to encourage reviewing judges to be less deferential, and thus more probing, of agency science.”); see also *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993).

19. See Joseph Farrell & 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 BERKELEY TECH. L.J. 943 (2004) (arguing that skewed incentives prevent litigation from being a reliable tool for assessing patent validity).

20. See Ghosh & Kesan, *supra* note 2, at 1226 (“[C]ourts can only review the validity of a patent application if it is the subject of an opposition or an infringement action.”). Average pendency times vary by technology, from two years to over three and a half years. See ANNUAL REPORT, *supra* note 12, at 121 tbl. 4.

21. See, e.g., Patent Reform Act of 2005, H.R. 2795, 109th Cong. § 9 (2005); Mark Lemley et al., *What to Do About Bad Patents?*, REGULATION, Winter 2005–2006, at 10, 13 (arguing for “post-grant opposition,” described as “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”).

What if we could reform the application process and guarantee better patents before costly litigation? What if we could ensure that only the most worthwhile inventions received twenty years of monopoly rights? What if we could offer a way to protect inventors' investments while still safeguarding the market 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 addresses the contention that an information deficit is the central problem in the patent review process by proposing a new reform model that might revolutionize the process of patent examination. This proposal for open patent examination (nicknamed "Peer-to-Patent") separates scientific from legal decision-making. By means of an online network, the scientific community provides what it knows best — scientific information relevant to determining the novelty and non-obviousness of a patent application. With her deep knowledge of the pertinent statutory standards, the patent examiner then uses that input to make a legal determination of patentability. In this model, the patent examiner remains the ultimate arbiter.

This model for administrative decision-making has the potential to remedy the information deficit and improve patent quality. Its enactment requires no statutory or regulatory changes. By redesigning the model for patent examination, this proposal points the way towards a new approach for administrative law, not by altering statutory or judicial standards, but by improving agency institutional competence. It goes beyond traditional administrative practices like peer review by combining expertise with openness. The model also improves on notice-and-comment rulemaking by making citizen participation more open and collaborative and the legal decision-making process more transparent and accountable to a broad community of self-selected experts.

This Article focuses on patent examination as administrative practice.²² It shifts the focus to the institutional competence of the agency and highlights new opportunities for patent reform. At this juncture, when neither Congress²³ nor the U.S. Supreme Court²⁴ is

22. Cf. Stuart Minor Benjamin & Arti K. Rai, *Who's Afraid of the APA? What the Patent System Can Learn from Administrative Law*, 95 GEO. L.J. (forthcoming Nov. 2006), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=897307; Kristen Osenga, *Entrance Ramps, Tolls, and Express Lanes — Proposals for Decreasing Traffic Congestion in the Patent Office*, 33 FLA. ST. U. L. REV. 119 (2005) (proposing multi-tiered patent application and examination system); Farrell & Merges, *supra* note 19 (arguing that judicial review alone cannot fix the patent problem and advocating administrative solutions).

23. Patent lawyer, academic, and blogger Prof. Dennis Crouch writes: "Substantive patent reform legislation is dead for the year." Patently-O, http://www.patentlyo.com/patent/patent_legislation/index.html (July 28, 2006).

certain to enact patent reform, changing the administrative practices of the agency responsible for implementing patent law may be the best opportunity, not only to effect reform, but also to do so in ways that are data-driven and empirically measurable.

Current 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. This notion of bureaucratic expertise is premised upon a bygone reality, namely that the agency possesses the best information. We continue to trust in bureaucratic expertise that does not work rather than the collective intelligence that the Internet now makes possible.²⁵

In the spring of 2007, the USPTO will implement the model of "Peer-to-Patent" open review as a pilot called Community Patent Review.²⁶ The pilot focuses on integrating an open peer review process with the USPTO, creating and amalgamating a vetted database of prior art references to inform examination, and developing deliberation methodologies and technologies that allow community ranking of the data forwarded to the patent examiner. Community Patent Review is the first social software project to be directly connected to and have an impact on the legal decision-making process. Several companies, representing more than six percent of the total number of new patents, including Computer Associates, General Electric, IBM, Microsoft, Hewlett-Packard, and Red Hat, have already agreed to submit their patent applications for examination under this open system.²⁷ To-

24. While the Supreme Court has heard other patent-related cases this year, the much-anticipated case reviewing the substantive scope of patentability was not decided on the merits. See *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2976 (2006) (dismissing writ of certiorari as improvidently granted). Furthermore, the Supreme Court rarely reviews the Federal Circuit. See Mark D. Janis, *Patent Law in the Age of the Invisible Supreme Court*, 2001 U. ILL. L. REV. 387, 387 (2001) ("The Court of Appeals for the Federal Circuit, created in 1982, has become the de facto supreme court of patents."). The 2005 Term was an exception to this practice. See *eBay Inc. v. MercExchange, LLC.*, 126 S. Ct. 1837 (2006); *Illinois Tool Works, Inc., v. Indep. Ink, Inc.*, 126 S. Ct. 1281 (2006); *MedImmune, Inc. v. Genentech, Inc.*, 126 S. Ct. 1329 (2006) (mem.); *KSR Int'l v. Teleflex*, 126 S. Ct. 2965 (2006) (mem.).

25. See Yochai Benkler, *Coase's Penguin, or, Linux and The Nature of the Firm*, 112 YALE L.J. 369 (2002); see also *The Digital Universe*, <http://www.digitaluniverse.net/> (last visited Oct. 8, 2006) (offering collaborative web portals to foster expertise).

26. USPTO, DRAFT STRATEGIC PLAN 2007–2012 18 (2006), <http://www.uspto.gov/web/offices/com/strat2007/stratplan2007-2012v6.doc> [hereinafter DRAFT STRATEGIC PLAN].

27. See *The Peer to Patent Project*, <http://cairns.typepad.com/peertopatent/> (Oct. 24, 2006).

gether with the Omidyar Network and the MacArthur Foundation, they will fund this program for the USPTO.²⁸

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, the majority of patent applications are published after eighteen months whether ultimately granted or not,²⁹ providing the legal foundation for open review; third, expert public participation in the form of peer review is widely practiced in the public sector and therefore is a familiar model; fourth, we have social reputation and networking technology that makes open review on this scale possible; and fifth, we have the necessary expertise with collaborative decision-making systems to be able to design and construct a new model of administrative practice for the USPTO.

This Article describes the patent system's information deficit problem and outlines a detailed draft blueprint for the Community Patent Review pilot. Part II discusses the current state of patent law and patent examination in the United States and the problems to which it gives rise. It demonstrates how the information deficit hampers effective patent review.

Part III explains that 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. As traditionally practiced, it also comes too late in the game to be useful to remedy the information deficit that impedes quality decision-making.

Part IV sets out the proposal for open peer review and argues for opening up patent examination, not to authenticated experts, but to the collective community. Open review combines the transparency and self-selection of public participation with the structured practices and expertise of peer review. Metaphorically, it marries the practices of Wikipedia to the authority of administrative law.³⁰ This section describes the design features of the Community Patent Review Pilot that will implement the model.

Part V explains how open review helps to solve the patent quality problem, is superior to alternative reforms, and benefits the public. It does so by anticipating objections in a question and answer format.

28. The pilot project is designed and run by the author under the auspices of the New York Law School Institute for Information Law & Policy. See The Peer to Patent Project, <http://www.dotank.nyls.edu/communitypatent/> (last visited Nov. 17, 2006).

29. Under the current rule, most patent applications are published after eighteen months, unless the applicant (1) requests otherwise and (2) is not required to publish the application in a foreign jurisdiction. 35 U.S.C. § 122 (2000). The Patent Reform Act of 2005 would eliminate this exception. H.R. 2795, 109th Cong. § 9(a) (2005).

30. See Nicholas Varchaver, *Patent Review Goes Wiki*, FORTUNE, Aug. 21, 2006, at 18.

The Article then concludes with a discussion on institutional competence, claiming that by applying technology to improve the patent examination process itself, we can bring about legal reform faster than traditional strategies that view Congress and the courts as the only institutional mechanisms for change, and in so doing, capture the benefits of empirical experimentation.

Patent examination urgently needs improvement to remedy the informational deficit that gives rise to low quality patents. Open review offers the structure through which we can 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 examination at the USPTO promise to benefit not only intellectual property law and policy, but administrative practice in general.

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.”³¹ At the founding, it was an inexpensive way for the new federal government to provide a utilitarian basis to stimulate innovation.³² It was also one of the only constitutional clauses incorporated without debate.³³ Perhaps this was because the delegates felt, as Mark Twain later expressed it, that “a country without a patent office and good patent laws was just a crab and couldn’t travel any way but sideways or backwards.”³⁴

While patents have provided an incentive for national competitiveness and stimulated investment in new technologies,³⁵ there is a general consensus that the crab is traveling backwards: many perceive the system to be broken. At a minimum, an issued patent must set forth an invention that is novel, useful, non-obvious, and described with enough specificity to be practiced.³⁶ Yet of the two million patents in force in the United States,³⁷ many do not qualify. The patent

31. Abraham Lincoln, Lecture on Discoveries and Inventions (Feb. 11, 1859), in ABRAHAM LINCOLN: SPEECHES AND WRITINGS 1859–1865 3, 11 (Don E. Fehrenbacher ed., 1989).

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

33. See *id.* at 107–10.

34. MARK TWAIN, A CONNECTICUT YANKEE IN KING ARTHUR’S COURT 58 (Signet Classics 2004) (1889).

35. See *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.”).

36. See *infra* notes 77–81 and accompanying text.

37. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1501 (2001).

awarded to Smucker's for the crustless peanut butter and jelly sandwich is, by now, legendary.³⁸ Adam Jaffe and Josh Lerner regale the reader in their book *Innovation and Its Discontents*³⁹ with many more horror stories of patents that are anything but "non-obvious" — for example, a patent awarded to a five-year-old boy for "Method of Swinging on a Swing"⁴⁰ and a patent on a method for drafting a patent.⁴¹ The "Patently Silly" weblog has dozens more.⁴² Even lawyers are getting into the game, seeking to patent estate planning and other legal techniques that have been practiced in the industry for decades.⁴³

An industry has arisen in patent "trolling," where participants seek patents solely for the purpose of initiating infringement lawsuits and extorting licensing fees from competitors without producing any product or bringing any innovation to the market.⁴⁴ Patent law provides the inventor with a monopoly right to exclude others from using, selling, making, or practicing the invention,⁴⁵ but does not impose a concomitant obligation to do the same.⁴⁶ This means, for example, that the oil industry could patent solar energy inventions that will be put on the shelf and never used. Since "anything under the sun"⁴⁷ can be patentable subject matter and more people are filing patents than ever before,⁴⁸ the field is fertile for companies seeking to patent undeserving inventions and to profit from the threat of litigation rather than from productive research and development.⁴⁹ Of course, patenting activity may also reflect productive invention. But a low quality patent over a fundamental research method, if issued, runs the risk of impeding downstream invention and hampering scientific innovation.

38. U.S. Patent No. 6,004,596 (filed Dec. 8, 1997).

39. JAFFE & LERNER, *supra* note 2; see also Rochelle Dreyfuss, *Pathological Patenting: The PTO as Cause or Cure*, 104 MICH. L. REV. 1559 (2006) (reviewing JAFFE & LERNER, *supra*).

40. U.S. Patent No. 6,368,227 (filed Nov. 17, 2000).

41. Machine for Drafting a Patent Application and Process for Doing Same, U.S. Patent No. 6,574,645 (filed Feb. 19, 2002).

42. Patently Silly, <http://www.patentlysilly.com/> (last visited Oct. 8, 2006).

43. See Establishing and Managing Grantor Retained Annuity Trusts Funded by Non-qualified Stock Options, U.S. Patent No. 6,567,790 (filed Dec. 1, 1999). At least one author has advocated against granting patents for legal methods. See Andrew A. Schwartz, *The Patent Office Meets the Poison Pill: Why Legal Methods Cannot Be Patented*, 20 HARV. J.L. & TECH. (forthcoming Spring 2007).

44. See Zachary Roth, *The Monopoly Factory*, WASH. MONTHLY, June 2005, at 12, 18.

45. 35 U.S.C. § 154(d)(1) (2000).

46. See *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 429 (1908).

47. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) ("Congress intended statutory subject matter to 'include anything under the sun that is made by man.'") (quoting S. REP. NO. 82-1979, at 5 (1952); H.R. REP. NO. 82-1923, 6 (1952)).

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

49. See Manny W. Schechter, *Open Collaboration is Medicine for Our Ailing Patent System*, 72 PAT. TRADEMARK & COPYRIGHT J. 682, 682-85 (2006) (explaining the connection between low quality patents and the costs of increased litigation from patent trolling).

The problem is that as old and obvious as an idea might seem, finding the relevant written information to invalidate it during the review process can be quite difficult, especially under the time and resource constraints created by the backlog and with double the number of applications as there were ten years ago.⁵⁰ This creates an opportunity for individuals to exploit the deficiencies in the system.

The USPTO is awarding patents improvidently because of a lack of access to adequate information and an inability to apply it effectively. Bureaucrats are supposed to possess “the knowledge that comes from specialized experience.”⁵¹ Yet the reality is that fifty-five percent of patent examiners — supposedly expert bureaucrats — have been employed by the USPTO for fewer than two years, and examiners are not required to possess an advanced degree.⁵² They are also underpaid, earning approximately \$55,000 a year while an associate in a Manhattan law firm earns a base salary of \$145,000.⁵³ While not all patent examiners are lawyers eligible for law firm jobs, the USPTO still cannot hire quickly enough to keep pace with both the demands of the job and the attrition rate.⁵⁴ Arguably, the USPTO today produces no better results than the registration regime the United States abandoned in 1836.⁵⁵

Patent examiners enjoy a great deal more discretion than their bureaucratic counterparts at other agencies. Patent examiners are responsible for granting a twenty-year monopoly when a first- or second-year civil servant at another agency would be drafting memoranda.⁵⁶

50. See ANNUAL REPORT, *supra* note 12, at 119 tbl. 2.

51. Richard B. Stewart, *The Reformation of American Administrative Law*, 88 HARV. L. REV. 1669, 1678 (1975).

52. JAFFE & LERNER, *supra* note 2, at 135–36.

53. See *supra* note 10.

54. There are currently over 4000 patent examiners with plans to increase that number to 7200 in order to address the backlog. See DRAFT STRATEGIC PLAN, *supra* note 26, at 13.

This level of hiring is a critical component of the plans [sic] 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.

Id.

55. See JAFFE & LERNER, *supra* note 2, at 142; see also Giles S. Rich, *Laying the Ghost of the “Invention” Requirement*, 14 FED. CIR. B.J. 163, 165 (2004) (“[T]he examination system as set up under the first patent act proved unworkable and the Act of 1793 was passed under which we went to a registration system for 43 years. That too was unworkable and by the Act of 1836 we established the Patent Office . . .”).

56. See JAFFE & LERNER, *supra* note 2, at 138 (“[I]nexperienced, underpaid, and overworked patent examiners are making decisions on final administrative actions in a way that their equally junior counterparts at other agencies are not.”).

The problems that result from examiners' wide-ranging discretion are exacerbated by increasing judicial deference to their decisions.⁵⁷

An understanding of the examination process and how information is retrieved illustrates the effect of the USPTO's inadequate access to relevant scientific resources. Inventors apply for one of three types of patents: utility, plant, or design. I focus on utility patents for my description of the review process because they are more numerous, complex, and economically significant. Utility patents are those that cover "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof."⁵⁸ This definition of patentable subject matter is construed broadly to cover "anything under the sun,"⁵⁹ including business methods,⁶⁰ computer algorithms,⁶¹ and even living organisms.⁶² However, laws of nature, natural phenomena, and abstract ideas are not patentable.⁶³

An inventor files an application electronically or by mail⁶⁴ to secure a filing date from which the twenty-year period of exclusivity will begin if the patent is granted.⁶⁵ This application contains a "specification," illustrations, an oath as to its ownership and truthfulness, and, of course, the requisite filing fee.⁶⁶ The specification includes a narrative description of the invention with details as to its background and any context necessary to understand its inventive contribution.⁶⁷ The specification must contain a written description of the invention being claimed.⁶⁸ Finally, the specification discloses the metes and bounds of the invention through the patent's "claims," which are the formalistic statements of the scope of the invention.⁶⁹ The application must also set forth the "best mode" for implementing the invention.⁷⁰

There is a well-established information taxonomy by which patents are sorted and organized. The USPTO labels the application with one of about 450 class and about 150,000 sub-class designations to

57. See James Bessen & Michael J. Meurer, *Lessons for Patent Policy from Empirical Research On Patent Litigation*, 9 LEWIS & CLARK L. REV. 1, 18–19 & n.93 (2005) (discussing an empirical study of patent validity and noting an increasing validity rate since the creation of the Federal Circuit).

58. 35 U.S.C. § 101 (2000).

59. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

60. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375 (Fed. Cir. 1998).

61. *Diamond v. Diehr*, 450 U.S. 175, 185–87 (1981)

62. *Chakrabarty*, 447 U.S. at 309.

63. MPEP, *supra* note 4, § 2105.

64. See 37 C.F.R. §§ 1.8, 1.52 (2006).

65. 35 U.S.C. § 154(a)(2) (2000).

66. *Id.* § 111(a)(3).

67. See 37 C.F.R. § 1.71.

68. 35 U.S.C. § 112 (2000).

69. *Id.*

70. *Id.* The best mode requirement ensures that the public learns the best way to use the invention. *Eli Lilly & Co. v. Barr Lab. Inc.*, 251 F.3d 955, 963 (Fed. Cir. 2001).

enable indexing, sorting, and retrieval of the relevant application and materials.⁷¹

In the course of the ensuing patent review, known as patent prosecution, the examiner may correspond with the inventor in a series of colloquies known as “office actions,” whereby the examiner rejects and the applicant amends the pending application.⁷² The inventor can amend the application during prosecution in an effort to narrow the claims until they are allowable.⁷³ Even if the examiner eventually rejects the application, an inventor may respond by filing a continuation⁷⁴ or amendment⁷⁵ or by filing an appeal with the Board of Patent Appeals and Interferences.⁷⁶ Prosecution ends when the patent is either granted or the application is abandoned.

The examiner reviews an application under five major statutory criteria: patentable subject matter,⁷⁷ utility,⁷⁸ novelty,⁷⁹ non-obviousness,⁸⁰ and enablement.⁸¹ The subject matter requirement screens erroneously filed applications as well as applications directed to an idea, conception, law of nature, or similarly abstract phenomenon.⁸² The utility requirement dictates that patents issue for operable and functioning inventions and that these inventions serve a public purpose.⁸³ Patents are seldom rejected for lack of utility.⁸⁴

The core of the examination centers around two inquiries: novelty and non-obviousness. Novelty asks whether the invention is new.⁸⁵ Non-obviousness asks whether the invention is more than an obvious advance over what came before from the perspective of one with ordinary skill in the field of the invention.⁸⁶

To decide the question of novelty, the examiner asks whether the claimed invention differs from previous inventions. This requires a

71. See USPTO, Classification Help File, <http://www.uspto.gov/web/patents/classification/help.htm> (last visited Jan. 23, 2006).

72. See 37 C.F.R. § 1.104 (2006).

73. *Id.* § 1.111(c) (2006).

74. See *id.* § 1.114 (2006).

75. See *id.* § 1.116 (2006).

76. See 35 U.S.C. § 134 (2000).

77. See *id.* § 101 (2000) (allowing grant of a patent for “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”).

78. See *Brenner v. Manson*, 383 U.S. 519, 528–29 (1966); see also 35 U.S.C. §§ 101, 112 (2000).

79. 35 U.S.C. § 102 (2000).

80. *Id.* § 103.

81. See *id.* § 112.

82. See *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

83. See *Brenner*, 383 U.S. at 534–35.

84. The utility requirement is generally a more significant hurdle for pharmaceutical products and biotechnology than for mechanical inventions. 1 DONALD S. CHISUM, CHISUM ON PATENTS § 4.01 (2006) (citing *In re Fisher*, 421 F.3d 1365 (Fed. Cir. 2005)).

85. See *Diehr*, 450 U.S. at 190.

86. 35 U.S.C. § 103(a) (2000).

search for the “prior art” — the potentially pre-empting knowledge that existed at the time of the invention. Prior art is not 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.⁸⁷

The examiner’s options for searching the prior art are limited. Patent examiners, especially those who are unable to use the Internet, must rely on three computer systems in place at the USPTO: Examiner’s Automated Search Tool (“EAST”), Web-Based Examiner Search Tool (“WEST”), and Foreign Patent Access System (“FPAS”).⁸⁸ These databases provide access to prior U.S. patents, foreign patent abstracts, certain pending U.S. applications, and additional proprietary database libraries.⁸⁹ The USPTO databases are not exhaustive. While an examiner might be inclined to use Google to look up information online, the use of Internet research is restricted for security reasons, as there is a risk that examiner searching could be tracked.⁹⁰ In effect, the examiner is limited to internal sources available at the office.

Empirical data confirms the inadequacy of USPTO search capabilities. In a recent study of 502,687 utility patents, examiners were found to have a disadvantage in searching for non-patent prior art or foreign patents.⁹¹ Interestingly, while patent examiners accounted for forty-one percent of the citations to previous U.S. patents, they accounted for only ten percent of references to non-patent prior art.⁹² The study concludes that this gap is due to inferior search capabilities for prior art other than U.S. Patents.⁹³

Examiners are not independently finding what they need, and applicants are not required to provide it.⁹⁴ Furthermore, third parties are

87. See 1 CHISUM, *supra* note 84, § 3.04.

88. MPEP, *supra* note 4, § 902.03(e).

89. *See id.*

90. *See* MPEP, *supra* note 4, § 904.02(c) (“This policy also applies to use of the Internet as a communications medium for connecting to commercial database providers.”); Internet Usage Policy, 63 Fed. Reg. 57,101, 57,103 (Oct. 26, 1998) (“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.”).

91. Bhaven N. Sampat, Determinants of Patent Quality: An Empirical Analysis, 2–3 (Sept. 2005) (unpublished manuscript), available at http://siepr.stanford.edu/programs/SST_Seminars/patentquality_new.pdf_1.pdf.

92. *Id.* at 8.

93. *See id.* at 13.

94. An applicant is required to disclose any information that is material to the prosecution of the patent. 37 C.F.R. § 1.63(b)(3) (2006). “[A]n applicant and his or her patent attorney [traditionally] were under no duty to conduct a search of the prior art.” 6 CHISUM, *supra* note 84, § 19.03(2)(b)(i). Sometimes applicants file no prior art at all. *See, e.g.*, Patent Chronicles, <http://www.patentchronicles.com/> (Mar. 23, 2005, 15:30 EST). 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.”

not reliable sources of information. In part, this is because Congress directed that the USPTO structure its procedures to prevent “protest or . . . pre-issuance opposition.”⁹⁵ Hence, independent third-party input is greatly restricted; it must be made by mail, within a two-month window, for a fee of \$180, and without commentary.⁹⁶ Not surprisingly, third-party input is rarely given. There were between forty and one hundred third party comments filed in 2005.⁹⁷ In sum, “the informational burdens on the examiner are clearly heavy — even before the examiner engages in the heavy lifting of interpreting the prior art.”⁹⁸

This gives rise to a “Goldilocks problem”: too little information,⁹⁹ too much information, and none of it just right. In searching for prior art — such as other patents or journal articles, websites, or other disclosures that might suggest that the invention is not new — the examiner sometimes finds nothing. While the patent may seem familiar to an examiner, often she cannot find other written material that actually teaches the claims of the patent. This is particularly the case in cutting-edge areas of innovation, such as business methods, where there is not a large pool of patents from which relevant prior art may be drawn.¹⁰⁰ Alternatively, the examiner is so inundated with related prior art, such as in the biotechnology field, that she has trouble reviewing the application, winnowing the material, and finding art that is relevant and useful for the examination process in the time allotted.¹⁰¹

It is not enough to ensure that the invention is new. The crux of the patentability determination is whether the invention represents a

Changes To Information Disclosure Statement Requirements and Other Related Matters, 71 Fed. Reg. 38,808 (July 10, 2006).

95. 35 U.S.C.S. § 122(c) (2006).

96. See MPEP, *supra* note 4, § 1134.01; 37 C.F.R. § 1.99 (2006). The patent examiner may not respond to the third party, except to process the fee. Robert Clarke, Deputy Director, Office of Patent Legal Administration, Presentation at Meeting of the USPTO (Feb. 16, 2006), http://cairns.typepad.com/peertopatent/files/community_patent_and_pto213v2.ppt.

97. Robert Clarke, Deputy Director, Office of Patent Legal Administration, Remarks at Meeting of the Community Patent Review Steering Committee (Sept. 11, 2006).

98. Petherbridge, *supra* note 5, at 183.

99. See Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763, 763 (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.”).

100. After the Federal Circuit made clear in 1998 that business methods were patentable subject matter, see *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), the number of applications for business method patents rose dramatically. See John R. Allison & Starling D. Hunter, *On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 BERKELEY TECH. L.J. 729, 730–31 (2006). Patent examiners have had difficulty finding “written references stating common knowledge” in this emerging field. See Arti K. Rai, *Allocating Power over Fact-Finding in the Patent System*, 19 BERKELEY TECH. L.J. 907, 914 (2004).

101. See Eli Kintisch, *US Patent Policy: PTO Wants to Tap Experts to Help Examiners*, 312 SCIENCE 982, 982 (2006).

significant enough advance over what came before. This decision is made from the perspective of the relevant expert, the “person having ordinary skill in the art to which [the] subject matter pertains.”¹⁰² As patent scholar Rebecca Eisenberg explains:

[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 to 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.”¹⁰³

The examiner’s manual suggests three bases for assessing obviousness. First, there must be “some suggestion or motivation” available to one having ordinary skill in the art “to modify the reference or to combine reference teachings.” Second, “there must be a reasonable expectation” that the invention will succeed. Finally, the prior art references, whether alone or in combination, “must teach or suggest all the claim limitations.”¹⁰⁴

Essential to this determination is that the examiner put herself in the shoes of the fictional person skilled in the art and render a determination through his eyes and not her own. This requires identifying the person and what characterizes his skill set.¹⁰⁵ The person skilled in the art is considered to be the best metric for the scope, content, and meaning of prior references.

Assessing the relevant information through the eyes of this fictional legal expert is an added burden on the examiner. The difficulty

102. 35 U.S.C. § 103(a) (2000).

103. Eisenberg, *supra* note 9, at 886 (quoting 35 U.S.C. § 103 (2000)).

104. MPEP, *supra* note 4, § 706.02(j).

105. *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.

Id.

of this task is illustrated by the fact that courts have largely given up on applying the standard:

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 documented in the written record.¹⁰⁶

In sum, to prevent the corruption of the examiner and unfairness to the applicant, USPTO procedures prescribe an insular process for patent application review. Examiners must rely on internal databases and are not permitted to consult outside sources. While the public may submit limited prior art, they may not submit any commentary or analysis after publication and before the grant of the patent application. The resulting information deficit inevitably results in patents issued without the benefit of the appropriate prior art or the perspective that could be brought to bear by expert inquiry. A solution to the problems that plague the examination process ought to help the examiner find the best information while allowing her to maintain her role as the ultimate legal arbiter of patentability.

III. WHY TRADITIONAL PEER REVIEW IS NOT THE SOLUTION

Peer review is the traditional solution proposed for the information deficit and information quality problems of administrative agencies.¹⁰⁷ I pause to consider, therefore, whether traditional peer review panels would solve these problems for the patent examination process. This Part concludes that because of a lack of transparency, traditional peer review is inappropriate in this context.

106. Eisenberg, *supra* note 9, at 888.

107. See SHEILA JASANOFF, THE FIFTH BRANCH: SCIENCE ADVISORS AS POLICY MAKERS 61–84 (1990); OFFICE OF MGMT. & BUDGET, JOSHUA B. BOLTON, ISSUANCE OMB'S FINAL INFORMATION QUALITY BULLETIN FOR PEER REVIEW, OMB Memorandum M-05-03 (Dec. 16, 2004).

Peer review is commonly used in government,¹⁰⁸ and is often a key part of the process of awarding research grants.¹⁰⁹ The National Science Foundation currently relies on a network of over 50,000 reviewers.¹¹⁰ The National Institutes of Health relies on outside review groups and advisory councils from the scientific community to review about seventy percent of its grant applications.¹¹¹ 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.¹¹²

Refereeing procedures 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 syllogism that links peer review to “good science” in the regulatory process.¹¹³

Peer review is also used to evaluate policy data and provide a mechanism for oversight of agency science. Congress has tried to improve the quality of information that agencies use and disseminate in other settings by increasing the use of peer review under the Information Quality Act (“IQA”).¹¹⁴ Under the Office of Management and

108. See, e.g., U.S. GEN. ACCOUNTING OFFICE, FEDERAL RESEARCH: PEER REVIEW PRACTICES AT FEDERAL SCIENCE AGENCIES VARY, GAO/RCED-99-99 (1999); U.S. GEN. ACCOUNTING OFFICE, PEER REVIEW: EPA NEEDS IMPLEMENTATION PROCEDURES AND ADDITIONAL CONTROLS, GAO/IRCED-94-98 (1994); U.S. GEN. ACCOUNTING OFFICE, PEER REVIEW: REFORMS NEEDED TO ENSURE FAIRNESS IN FEDERAL AGENCY GRANT SELECTION, GAO/PEMD-94-1 (1994); U.S. GEN. ACCOUNTING OFFICE, PEER REVIEW: COMPLIANCE WITH THE PRIVACY ACT AND FEDERAL ADVISORY COMMITTEE ACT, GAO/GGD-91-48 (1991); U.S. GEN. ACCOUNTING OFFICE, FEDERAL ADVISORY COMMITTEES: GSA’S MANAGEMENT OVERSIGHT AND GAO COMMENTS ON PROPOSED LEGISLATIVE AMENDMENTS, GAO/T-GGD-89-1 (1988); U.S. GEN. ACCOUNTING OFFICE, FEDERAL ADVISORY COMMITTEE ACT: GENERAL SERVICES ADMINISTRATION’S MANAGEMENT OF ADVISORY COMMITTEE ACTIVITIES, GAO/GGD89-10 (1988); U.S. GEN. ACCOUNTING OFFICE, UNIVERSITY FUNDING: INFORMATION ON THE ROLE OF PEER REVIEW AT NSF AND NIH, GAO/WED-87-87FS (1987); see also Lars Noah, *Scientific “Republicanism”: Expert Peer Review and the Quest for Regulatory Deliberation*, 49 EMORY L.J. 1033, 1047 (2000) (discussing various ways peer review is used in government).

109. See U.S. GEN. ACCOUNTING OFFICE, FEDERAL RESEARCH: PEER REVIEW PRACTICES AT FEDERAL SCIENCE AGENCIES VARY, *supra* note 108, at 2.

110. See Nat’l Sci. Found., *How We Work*, <http://www.nsf.gov/about/how.jsp> (last visited Oct. 20, 2006); see also Thomas O. McGarity, *Peer Review in Awarding Federal Grants in the Arts and Sciences*, 9 HIGH TECH. L.J. 1, 15 (1994).

111. Nat’l Insts. of Health, *About the Center for Scientific Review*, <http://cms.csr.nih.gov/AboutCSR/Welcome+to+CSR> (last visited Oct. 20, 2006).

112. McGarity, *supra* note 110, at 27.

113. JASANOFF, *supra* note 107, at 61.

114. See Lisa Heinzerling, *Risking It All*, 57 ALA. L. REV. 103, 111 (2005) (describing the IQA as “a one paragraph measure slipped into an appropriations bill without debate”);

Budget (“OMB”) Agency Information Quality Guidelines, independent peer review of data creates a presumption that the data is of sufficient objectivity to be disseminated.¹¹⁵ In its Final Information Quality Bulletin for Peer Review, OMB mandates that agencies employ peer review. The Bulletin sets forth detailed requirements for peer review that focused on “timing of peer reviews, selection of reviewers, transparency of review, and opportunities for public participation.”¹¹⁶

This predilection for peer review is not surprising since both agencies and the scientific community have longstanding experience with peer review practices.¹¹⁷ 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.¹¹⁸

At first glance, traditional peer review appears to be a fairly conservative means to attack the information quality problem and seems to provide much needed oversight and accountability.

Unfortunately, peer review is fraught with problems that undermine its credibility.¹¹⁹ This has prompted several leading scientific

see also Act of Dec. 21, 2000, Pub. L. No. 106-554 app. C, § 515, 114 Stat. 2763, 2763A-153 to 154 (2000) (codified at 44 U.S.C. § 3516 note (2000)).

115. See Office of Mgmt. & Budget, Information Quality Guidelines, 67 Fed. Reg. 8452, 8459 (Feb. 22, 2002).

116. Stephen Johnson, *Reforming the Information Quality Act*, 58 ADMIN. L. REV. 60 (2005); see also Final Information Quality Bulletin for Peer Review, 70 Fed. Reg. 2664, 2665 (Jan. 14, 2005).

117. See Mohammed Kashef, Scientific Peer Review in the Public Sector 1 (Dec. 5, 2005), http://dotank.nyls.edu/communitypatent/peerreview_dec05.pdf (“[Peer review] 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.”).

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

119. See JASANOFF, *supra* note 107, at 69–76; Wendy E. Wagner, *The “Bad Science” Fiction: Reclaiming the Debate over the Role of Science in Public Health and Environ-*

organizations to attack existing governmental peer review frameworks.¹²⁰ These problems stem from the fact that it is an elite, closed process and therefore subject to manipulation. Though the process is not secretive,¹²¹ it is closed in the sense that agency peer review groups are empanelled, not self-selected. As a result, only certain kinds of industry and academic experts will typically be invited. It is therefore possible to stack the deck with ideologues, creating peer review mechanisms that are characterized not by deliberative disagreement but by unproductive conflict. The selection criteria need not be based on politics — though a political litmus test is frequently imposed¹²² — but they may be based on educational or social status, thereby shutting out otherwise qualified and meaningful contributors.

Because there is no single definition of peer review,¹²³ the mere fact that an agency employs a process by the name of “peer review” does not ensure transparency or quality. There are no assurances that

mental Regulation, 66 LAW & CONTEMP. PROBS. 63, 67–71. (2003); Sidney A. Shapiro, *Politicizing Peer Review: The Legal Perspective*, in RESCUING SCIENCE FROM POLITICS 238–254 (Wendy Wagner & Rena Steinzor eds., 2006).

120. See OMB Watch, Peer Review News, <http://www.ombwatch.org/article/archive/232> (last visited Oct. 10, 2006) (archiving objections to OMB peer review guidelines); see also DefendingScience.org, OMB’s Peer Review Guidelines, http://www.defendingscience.org/public_health_regulations/peer_review_guidelines.cfm (last visited Sept. 24, 2006); Chris Mooney, Committee for the Scientific Investigation of Claims of the Paranormal, The Politics of Peer Review, Jan. 8, 2004, <http://www.csicop.org/doubtandabout/peerreview/> (“[Y]ou 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.’”).

121. The Federal Advisory Committee Act ensures that advice rendered by advisory committees is open and accessible. 5 U.S.C. app § 2 (2000).

122. 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 (2004), http://www.ucsusa.org/scientific_integrity/interference/nih-drug-abuse-panel.html. This is not the only recent example of political pressures coming to bear on scientific policymaking. See Union of Concerned Scientists, Political Litmus Tests at the Fogarty International Center, http://www.ucsusa.org/scientific_integrity/interference/fogarty-international-center-advisory-board.html (last visited Nov. 17, 2006) (“[M]ore scientists have disclosed their personal experiences with political litmus tests applied by the Bush administration in the appointment process for a wide range of scientific advisory positions.”); Union of Concerned Scientists, Scientific Integrity in Policy Making: An Investigation into the Bush Administration’s Abuse of Science, http://www.ucsusa.org/scientific_integrity/interference/reports-scientific-integrity-in-policy-making.html (last visited Nov. 17, 2006) (describing general patterns of political influence on the process of scientific policy making).

123. See J.B. Ruhl & James Salzman, *In Defense of Regulatory Peer Review*, 84 WASH. U. L. REV. 1, 14 (2006) (arguing that the right type of peer review can play a role in appropriate circumstances).

what they do is based on good science rather than political prejudice. The Government Accountability Office (“GAO”) has found, for example, that “further improvements are needed to expand the scope of peer reviews [at the EPA] and make them more independent,” and that the implementation of the EPA’s peer review policy has been “uneven.”¹²⁴

Peer review is also time-consuming to organize¹²⁵ and run.¹²⁶ Because the group has to be selected, vetted, and approved, disputes can arise over membership. 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 defended, but the convenor may have to defend the scope of work. Hence, setting up peer review panels requires setting boundaries and, subsequently, policing and defending those boundaries.

It is, perhaps, in part because of the work required to maintain a peer review system that review generally happens late in the process — too late to have a significant impact on regulatory decision-making. Agencies ask for public comment once a rule is already written, often allotting the public only a short window in which to provide feedback¹²⁷ and leaving little room for meaningful change.

The closed process fits well, however, 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,” writes Professor Gerald Frug.¹²⁸ Closed peer review

124. Raul & Dwyer, *supra* note 18, at 13; *see also id.* at 7 n.24 (“[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, No. 00-270 (2000)).

125. *See* Sidney Shapiro, Data Quality: The Data Quality Appropriations Rider: New Procedures and Information Disclosure, Center for Progressive Reform, <http://www.progressiveregulation.org/perspectives/dataQuality.cfm> (last visited Aug. 14, 2006) (“[P]rocedural 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.”).

126. *See* Megan Sever, *Government Peer Review*, GEOTIMES (Nov. 2003), http://www.agiweb.org/geotimes/nov03/NN_peerrev.html (“Opponents, however, warn that the [peer review] 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.”).

127. The Administrative Procedure Act provides for a minimum window of 30 days of public consultation. *See* 5 U.S.C. § 553(c), (d) (2006).

128. Gerald E. Frug, *The Ideology of Bureaucracy in American Law*, 97 HARV. L. REV. 1276, 1333 (1984) (emphasis omitted). Frug goes on to point out, quoting the moral philosopher Alasdair MacIntyre, that “‘Bureaucratic Man’ can thrive only if all of us invent a

arguably supports this self-proclaimed expertise by lending credibility to the agency's assertion of expert knowledge.

IV. "PEER TO PATENT": THE OPEN REVIEW ALTERNATIVE

Institutional processes are needed to overcome the problems of closed peer review and create more transparent mechanisms that bring scientific expertise to bear earlier in the patent review process. Doing so should not be overly time-consuming and burdensome for the patent examiner or for long-suffering inventors who are already waiting years in line at the USPTO.

In other domains, the combination of open technology and well-defined process has successfully enabled a distributed group to share expertise. Open self-selection, rather than closed peer review, makes it possible for Wikipedia to harness public knowledge and create an encyclopedia with over one million entries¹²⁹ of quality comparable to that of traditional, centrally edited encyclopedias.¹³⁰ 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.¹³¹ CNET offers a platform to share expertise about electronics and technology.¹³² The Internet Movie Database, the largest repository of information about cinema, draws much of its content from volunteers submitting data about films and movie stars.¹³³ The 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.¹³⁴

fiction of expertise that assigns to the character of the 'broad-gauged' leader a role that justifies our own powerlessness." *Id.*

129. See Wikipedia, *Wikipedia*, <http://en.wikipedia.org/wiki/Wikipedia> (as of Nov. 20, 2006, 06:40 GMT) (stating that, as of this writing, there are over 1,400,000 entries).

130. See Jim Giles, *Internet Encyclopaedias Go Head to Head*, 438 NATURE 900 (2005) (discussing a *Nature* study demonstrating that Wikipedia is about as accurate as Encyclopaedia Britannica).

131. See Shay David & Trevor Pinch, *Six Degrees of Reputation: The Use and Abuse of Online Review and Recommendation Systems*, FIRST MONDAY, March 2006, http://www.firstmonday.org/issues/issue11_3/david/index_original.html (describing strategies and techniques of user reviews and recommendations on Amazon).

132. See CNET.com, <http://www.cnet.com/> (last visited Oct. 11, 2006).

133. See IMDb, The Internet Movie Database, <http://www.imdb.com/> (last visited Oct. 11, 2006); Wikipedia, Internet Movie Database, <http://en.wikipedia.org/wiki/IMDb> (as of Sept. 24, 2006 00:36 GMT) ("The IMDb website consists of the largest known single accumulation of data on individual films . . . Information is largely provided by a cadre of volunteer contributors, with only 17 members of the staff dedicated to monitoring the data received.").

134. Public Library of Science, Public Library of Science Announces PLoS ONE: A New Approach to Open-Access Publishing (June 7, 2006), http://www.plos.org/news/announce_plosone.html.

These experiments with online collaboration have shown that often “ordinary” people possess extraordinary knowledge that they are willing to share when it is easy to do so.¹³⁵ Making participation open and subject to self-selection can leverage not only the “wisdom of the crowd”¹³⁶ but also its enthusiasm. Experience with the tools now available is undermining traditional assumptions about how expertise must be organized and pointing the way toward the use of open models of scientific review to inform legal decision-making.

Patent examination is well-suited to pre-grant community participation because it depends on scientific expertise to make the correct determination. Just as a community of open source programmers can better spot mistakes in code than one individual can,¹³⁷ the applicable scientific and innovation community is better equipped to address the science found in patent applications. An examiner with access to limited information should not bear the sole responsibility of determining originality or obviousness when it is possible to harness the collective intelligence and experience of thousands. It is also illogical to turn to private firms to conduct this review, as the USPTO once suggested,¹³⁸ because this simply replaces one closed group with another, and may still exclude those with the greatest expertise in a given area.

Moreover, an open process for patent examination can encourage self-selection by those who are best equipped to contribute.¹³⁹ While a patent examiner might fruitlessly search for prior art for hours, if the process is open and publicly accessible, the appropriate expert is likely to know instantly whether an invention is reminiscent of earlier work or avenues of research. Expert *public* participation can provide the right information to the USPTO or otherwise guide the examiner’s research.

Technology is revolutionizing the capacity for purposive collective action: together we can accomplish what we cannot do alone.¹⁴⁰

135. See Yochai Benkler, *Freedom in the Commons: Towards a Political Economy of Information*, 52 DUKE L.J. 1245, 1256–57 (2003) (stating that peer production is the collaborative process by which individuals “contribute to a joint effort” to produce “information or culture”); Benkler, *supra* note 25.

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

137. As Eric Raymond says, “given enough eyeballs, all [software] bugs are shallow.” Eric S. Raymond, *The Cathedral and the Bazaar* (Sept. 11, 2000), <http://catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/index.html>.

138. See USPTO, *THE 21ST CENTURY STRATEGIC PLAN 10* (2003), http://www.uspto.gov/web/offices/com/strat21/stratplan_03feb2003.pdf (proposing that the USPTO investigate market-driven initiatives to “achieve greater examiner productivity by reducing their prior art search responsibilities”).

139. Cf. STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* 62 (2004) (describing the advantages of “voluntary participation and voluntary selection of tasks” in open source development) (emphasis omitted).

140. See Beth Simone Noveck, *A Democracy of Groups*, *FIRST MONDAY*, Nov. 2005, http://www.firstmonday.org/issues/issue10_11/noveck/.

The goal is to engineer the practices and the systems for an open collaborative information-gathering process to bring together the work of the scientist and the legal expert. Hopefully, this will improve governmental decision-making. At the same time, such a process makes it possible for citizens to engage in deliberating around questions of public importance and to participate in the important decisions of our democracy, including the future of patent monopolies.

The forthcoming USPTO Community Patent Review pilot, adopted based on an earlier draft of this article, will begin in April 2007. With inventor consent, between 250 and 400 software-related patents will be submitted for open patent examination. Open review will supplement, not replace, substantive examination by a USPTO examiner. The process will augment the current rules that permit third-party submission of comments for a fee and in writing. For the first time, third parties will be able to submit prior art with commentary online. To encourage participation, the USPTO will waive the fee for third party submissions. The USPTO will offer the added incentive of jumping consenting applicants to the front of the queue for expedited review.¹⁴¹

The design of the pilot puts the idea of open review into practice by means of unique technology and legal process. This design is based upon normative democratic principles. The pilot should foster participatory practices that enable citizen engagement and governmental accountability to a wider public. The process should be open, using not only open source software but also practices that are fully transparent. To that end, the pilot must maintain the same level of legitimacy and incorruptibility that characterizes traditional examination. Public involvement cannot come at the expense of corruption or undue influence. The pilot will be open to all those who want to participate constructively. The attempt is to create institutional mechanisms, not for any and all participation, but for informed, thoughtful participation that improves patent examination. Moderation, for this reason, is entirely appropriate. Ultimately, this pilot will demand, as the expression goes, “rough consensus and running code”¹⁴² — a willingness to experiment and iterate by responding to feedback and improving this new institution so that it serves its intended purposes while respecting core constitutional democratic values.

The pilot has one goal: to ensure that the knowledgeable public can submit prior art relevant to the patent application’s claims to the USPTO for consideration.

141. For additional details, see generally Beth Simone Noveck, Community Patent Review Project Summary, http://dotank.nyls.edu/communitypatent/p2p_exec_sum_sep_06.pdf.

142. Cf. Paul Hoffman & Susan Harris, The Tao of IETF: A Novice’s Guide to the Internet Engineering Task Force, <http://www.ietf.org/tao.html> (last visited Nov. 19, 2006) (describing phrase as a “founding belief” of the IETF).

Under the terms of the program, patent applicants may request review of their patent application under the Community Patent Review process. Once an applicant makes the request and files a consent with the USPTO, a copy of their patent application will be transferred to the Peer-to-Patent software system for a period of review. Each application will reside on a webpage where users can submit relevant prior art for two months. The two-month window tracks the amount of time currently available to members of the public wishing to submit written prior art under Rule 1.99.¹⁴³ Limiting the time for submission will ensure that excessive volume does not overload the patent examiner or delay substantive patent examination. It may also create an impetus to participate by offering enough time for thoughtful work without inducing delay. On the basis of experimentation, the window for input may be increased to four or more months.

To ensure that those with the necessary know-how can navigate to the right patent application, the design of the software system must be optimized to ensure participation. Potential contributors can search applications, share them with colleagues, and subscribe to receive notifications and updates. Visualization aids will help contributors track the level and contentiousness of activity around a particular patent application. These aids may not only help to make information about the patent application visible to participants, but also make help the community involved in submitting prior art more self-aware. To suggest patents to review, the system might employ a collaborative filtering system akin to Amazon's — prompting users with statements such as "People who submitted prior art for this patent also read Patent X."

In addition, reviewers can "tag" or label applications with their own designations. While patents are officially classified by the USPTO, this kind of supplementary community self-tagging, called a "folksonomy,"¹⁴⁴ 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. For example, a member of what the USPTO calls Class 482 Exercise Devices¹⁴⁵ might commonly be known among physical therapists as an "elliptical machine." A reviewer might label a device classified under Class 438 Semiconductor Device Manufacturing as a "chip." By making label-

143. See *supra* note 96 and accompanying text.

144. See Wikipedia, *Folksonomy*, <http://en.wikipedia.org/wiki/Folksonomy> (as of Sept. 27, 2006, 23:36 GMT); see also Clay Shirky, *Ontology is Overrated: Categories, Links, and Tags*, http://www.shirky.com/writings/ontology_overnated.html (last visited Sept. 28, 2006).

145. The Patent Classification System can be found online, arranged alphabetically, by subject matter, by class number, and by art unit. See Office of Patent Classification, <http://www.uspto.gov/web/offices/opc/> (last visited Nov. 17, 2006).

ing more granular and precise, such a folksonomy could help contributors self-assign to areas of interest.¹⁴⁶

To ensure that contributors can submit prior art in ways that make participation easy for the contributor but manageable to read for the patent examiner, the system will offer a variety of participation options, some of which will demand more commitment than others. These include rating patent claims, submitting examples of prior art, commenting on prior art submissions, ranking prior art submissions, and rating other contributors.

In order not to wind up the machinery of peer review where it is not needed, the system must channel the expertise of the community where it is most useful. Because current law does not permit the examiner to communicate with the public to indicate which claims are the most important, the software will allow the community to provide this direction. Users can vote on the most critical claims where research should be focused. For instance, 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.

Contributors will collaborate to submit and annotate prior art to assist the examiner with the patent application review process. This will require the contributor to identify the claims to which a piece of prior art pertains, whether it predates the invention at issue, and the reasons the submitter believes the prior art relates to the conditions for patentability. Unlike the current paper-based system, in the pilot, the contributor must provide this commentary along with the submission to demonstrate relevance. For a pilot, applicants can consent to receive commentary. Eventually, the law might be changed to permit third-party comment on pre-grant submissions. Contributors can collaborate online to provide that commentary in order to understand thoroughly the relevance of a submission to a given claim.

Directions, instruction, and even moderation will be essential to educate the community about useful and appropriate submissions. The software can do some of the "heavy lifting" to ensure that submissions are provided in the appropriate form. For example, if the date of the prior art submission does not predate the invention, it will automatically be rejected. If the date is falsified or mistyped, however, a human moderator can reject a submission before it is posted publicly online. Members of the participating peer review community will be

146. User created taxonomy and classification systems have been proposed in other disciplines. See Andrew Polaszek, Commentary, *A Universal Register for Animal Names*, 437 NATURE 477 (2005). Existing websites have already implemented similar technology. See, e.g., del.icio.us About Page, <http://del.icio.us/doc/about> (last visited Sept. 28, 2006).

able to improve the quality of information by annotating a prior art submission, providing additional bibliographic information, direction, and commentary.

A prior art submission must contain enough bibliographic and substantive information to allow other contributors to view and comment on it, such as a patent number or a URL. Where information is available only in hard copy, relevant portions might be excerpted and posted online, or the entire document might be scanned in and made available. In all cases, a complete copy must be transmitted to the USPTO for consideration as part of the legal record.

The information shared as part of the public review process must comply with the relevant laws, including copyright law. Where contributors are sharing patents or other public domain material as prior art, there are no copyright concerns. But when a contributor wishes to upload a copy of a copyrighted journal or magazine article, computer code, or other information, this could give rise to liability for copyright infringement for the contributor as well as secondary liability for those administering the Community Patent Review project. When the desired information is freely available online, problems can be averted by linking to third party websites. The Peer-to-Patent system will require the inclusion of a URL. Where information is in hard copy or otherwise not freely available online (for example, a password-protected journal website), an excerpt or quote can be shared publicly under the doctrine of fair use.¹⁴⁷ In this case, I would argue that it is fair use even if a user uploads and the software transmits a single copy of the information privately to the USPTO so long as it is not made accessible or visible to the public. It might also be fair use to display a single locked-down copy on the website along with a notice and take-down policy to offer copyright holders some recourse.¹⁴⁸ This may not, however, completely protect the contributor who scanned and uploaded a copyrighted document for this purpose. Thus, while it will be preferable to rely on the use of licensed and public domain works, the project might also necessitate testing the boundaries of fair use, though, arguably, with very low risk. It may also be possible to obtain licenses from scientific and technical publications to use their work in connection with this project.

To succeed, this process must uncover useful and relevant prior art without overwhelming the patent examiner with information. Community Patent Review will allow the Peer-to-Patent community to rate the prior art for relevance, creating a searchable and sorted list

147. *See* 17 U.S.C. § 107 (2000).

148. *See* 17 U.S.C. § 512(e) (2000).

of information for the USPTO.¹⁴⁹ If users assign a numerical rating to a third party submission, software will be able to automatically sort the material, outputting a list of the top ten submissions as judged by the community. The system will forward only that “top ten” list to the examiner. This winnows the submissions, making them more manageable for the examiner. Presumably, it will also cause the best submissions to rise to the top. Eventually, additional rating schemes, including evaluative criteria provided by private systems, might be incorporated to enhance the quality of available information.

While software will automatically forward the top ten submissions to the USPTO at the end of the allotted time, the examiner will still have access to the full list, which she can search as she would any database. Those ten references can also be forwarded to the examiner in the format typically used by examiners when creating search reports.¹⁵⁰ The examiner can use as few or as many of the public submissions as she desires.

There is always the danger that competitors, ideologues, and vandals will attempt to game any rating system. Given the high economic stakes, it is likely that various parties will seek ways to cheat, whether to improve the standing of their own submissions of prior art or to suppress valid prior art submitted to defeat their own patents. While it is desirable for anyone, including competitors, to dig up the best prior art, the software must control against participants voting “early and often” and thereby skewing the ratings. In addition to technical tracking mechanisms that log which computer does the voting, clear terms of service must forbid any gaming of the rating system. Transparency in the voting process will also help to quell any impulses toward falsification.

However, even if the system is ultimately compromised, substantive patent examination is not harmed. Unlike Wikipedia, where generally any participant can change an entry, in Community Patent Review the patent examiner remains the ultimate decision-maker. The community review process does not derail substantive patent examination.

Finally, to encourage worthwhile participation and reward expertise in patent examination research, the system will award reputation points. Just as on eBay, where the point system signals who is a trust-

149. Digg, a “user powered” news site,” organizes its content based on similar principles. The community decides which contributors and content are best and corresponding information rises to the top. *See* digg: All, <http://digg.com/> (last visited Nov. 20, 2006).

150. These requirements are similar to those of an International Search Report filed by an examiner in a Patent Cooperation Treaty (“PCT”) review. In such a report, the examiner cites prior art, indicates the claim to which such prior art speaks, and codes the relevance of the submission. *See* MPEP, *supra* note 4, § 1844.01.

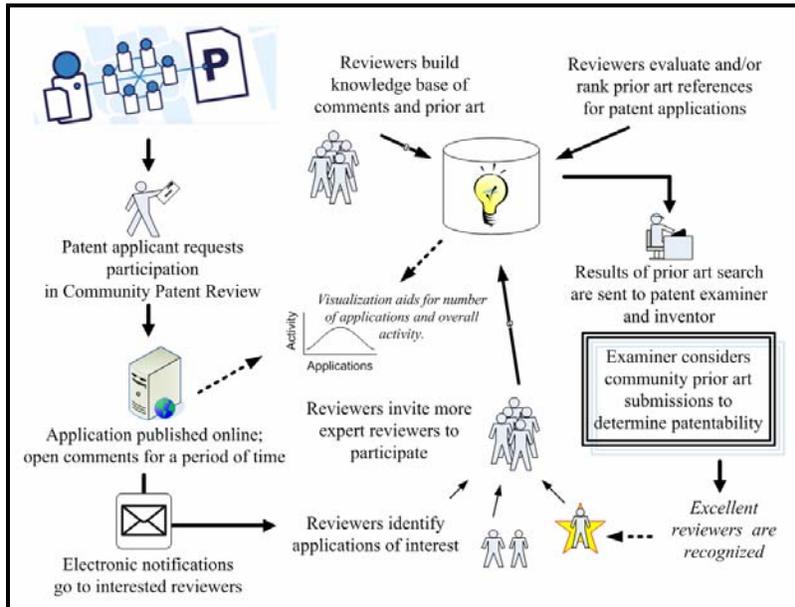
worthy buyer or seller,¹⁵¹ a similar reputation system here could be used to signal expertise. These “karma effects” will accrue from subjective and objective criteria. Subjective rewards come from submitting prior art that is deemed relevant by the community.¹⁵² Objective rewards come from submitting prior art that is used by the patent examiner in making her determination. This might encourage participation, for example, by graduate students or junior scientists, eager for professional recognition. The inventor might even extend a job offer to a contributor with a high rating who submitted useful information for the review of his application. While participants will be allowed and encouraged to submit information about their “real world” identity and education, status will not be measured on the basis of these traditional measures of expertise. Amateurs are capable of submitting worthwhile prior art. Additionally, professionals may be reluctant to identify themselves, uncertain about the appropriateness of participating in patent review on the job.¹⁵³ Hence the Peer to Patent software should measure expertise based on the quality of participation in this process, rather than with reference to external criteria.

151. For a description of eBay’s rating system, see *Evaluating a Member’s Reputation*, <http://pages.ebay.com/help/feedback/evaluating-feedback.html> (last visited Nov. 17, 2006). See also Peter Kollock, *The Production of Trust in Online Markets*, 16 *ADVANCES GROUP PROCESSES* 99, 100 (1999) (“Separating the two sides of the transaction by time or space (such as purchasing something by mail or on credit) introduces greater risks. The party who moves second must be considered trustworthy or have some other form of guarantee.”).

152. There are numerous existing social reputation software systems. Some focus on building social trust to support online social or dating relationships. These generally rate participants based on whom they know, such as MySpace or Facebook. See MySpace, <http://www.myspace.com> (last visited Nov. 19, 2006); Facebook, <http://www.facebook.com> (last visited Nov. 19, 2006). Others, like LinkedIn, provide a map of business relationships. See *Welcome to LinkedIn*, <http://www.linkedin.com> (last visited Nov. 19, 2006). Epinions bills itself as a “web of trust” system that builds social networks of product reviewers. See *Reviews from Epinions*, <http://www.epinions.com> (last visited Nov. 19, 2006). Kuro5hin employs a time-weighted average of ratings to sort comments. See *kuro5hin.org*, *FAQ—Comments*, <http://www.kuro5hin.org/?op=special;page=comments> (last visited Nov. 19, 2006). For additional examples, see Beth Simone Noveck, *Trademark Law and the Social Construction of Trust: Creating the Legal Framework for Online Identity*, 83 *WASH. U. L.Q.* 1733, 1752 & n.74 (2005).

153. Of course, this need not be the case. See Steven Lohr, *Hoping to Be a Model, I.B.M. Will Put Its Patent Filings Online*, *N.Y. TIMES*, Sept. 26, 2006, at C5 (“I.B.M. also said that its technical experts will spend ‘thousands of hours’ a year scrutinizing the patent filings of other companies.”).

Figure 1: Open Review Pilot Process



By adding these mechanisms for public participation in the review of patent applications, it will hopefully be possible to empirically test the impact of the project on the quality of expertise and participation, on examiner decision-making, and, ultimately, on the resulting quality of the issued patent. By means of automated and manual data collection during the course of the pilot, it will be possible to test the major hypotheses of the project: first, that the public is capable of self-selecting on the basis of expertise and producing information relevant to the patent examination process; second, that an open, human network of expertise will improve examiner work and work product; and finally, that a publicly reviewed patent will satisfy statutory criteria and, ultimately, result in greater licensing revenue and lower litigation costs. With evidence that such a process is useful, it will be possible to justify expanding this pilot program into institutionalized practice. It might also induce a change in the law to allow examiners to communicate directly with the scientific public.

V. WHY OPEN REVIEW?

The Community Patent Review project opens up the process of researching prior art to the public by dividing the prior art submission process into manageable tasks: (1) submission of prior art and com-

mentary in response to the pending application of a consenting applicant; (2) community identification of the claims that are most relevant; (3) generation of positive reputation points by successful participation; and (4) automated transmission of information to the patent examiner. This model of participation attempts to address the problems of closed peer review while introducing more information into the decision-making process.

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

A. For the Inventor

Inventors seek better information in order to strengthen their patent application. They want to know about relevant prior art before the patent issues in order to avoid the cost of unnecessary litigation later. Community Patent Review should help inventors uncover relevant prior art through community vetting. As Professor Peter Canelias put it, this system “affords the only real opportunity to implement the statutory standard for obviousness.”¹⁵⁴ By decreasing the probability of later litigation, peer review should produce a stronger and more valuable patent. Thus, inventors who prosecute through the peer review process should be able to extract more value when licensing their patents than those who do not.

B. For the Patent Examiner

Examiners fear that public participation will create more work. Furthermore, the USPTO, whose operations have been criticized, does not want to expend any political capital on ineffective reforms. This proposal is sensitive to these needs by supplying the examiner with an independently generated “top ten” list of prior art references. This will help produce information that is directly useful and also allow the examiner to perform a more targeted and efficient search of the prior art on the basis of know-how submitted by this “living database” of human researchers. By virtue of having many public readers, applicants may write better-researched applications which, in turn, improve examiner search practices. But even if Community Patent Review

154. E-mail from Peter Canelias, Adjunct Professor, New York Law School, to author (Mar. 17, 2006, 18:26:56 EST) (on file with author). He continued:

[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.

Id.

does create more work for an examiner, if this cost comes with the benefit of higher quality patents, it may be worth bearing.

C. For the Peer Reviewer

For peer contributors to participate, there must be tangible benefits to participation that outweigh the investment in time. The opportunity to produce better patent quality in their area of scientific invention will motivate scientists. By increasing confidence in the patent system, peer review can promote innovation, which benefits everyone. Participation is more likely when participants know that their contributions are likely to influence the final decision. In this project, public participation will be tied directly to examiner decision-making. The software transmits contributed prior art directly to the USPTO to ensure that there will be a meaningful connection between reviewers' contributions and the final decision. In addition, contributors will be able to participate to varying degrees. While one might do the necessary research to submit prior art, another might choose only to rate the prior art submitted by another.

D. Public Benefits

In the United States, millions of dollars are spent on unnecessary litigation and unjustified settlements that arise from patents that never should have been issued. For the public, the primary goal is to improve the patent system. Community Patent Review addresses the public interest by creating a system that could introduce more information into the process, defeating non-meritorious patent claims before they issue. The program aims to achieve that without falling into the pitfalls of traditional peer review.

There are numerous aspects of the system's design that attempt to improve the quality of issued patents, but openness is at the core of the solution. Dismantling the institutionalized boundaries of insular expertise allows public participants to self-select and introduce information into the process, transforming the fictional "person having ordinary skill in the art" into a reality.¹⁵⁵ Open review jettisons the classical conception of expertise. Philip Kitchner describes it:

155. Other proposals have sought to ground the PHOSITA standard in reality by creating incentives for the public to submit prior art. See, e.g., 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 by awarding prior art informants with a bounty assessed against applicants, the USPTO 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 BERKELEY TECH. L.J. 667 (2004); see also Michael J. Felton, *A Call for Bounty Hunters*, PATENTS & PROP., Mar. 2001, at 57–58, available at <http://pubs.acs.org/subscribe/journals/mdd/v04/i03/html/03patents.html> (discussing a website that implements a patent bounty by offering a reward for information that leads to the invalidation of a patent).

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.¹⁵⁶

If the aim is to find relevant prior art, the best knowledge may not come from the center, but from the periphery, among the enthusiasts or graduate students who are immersed in, but not yet well known for, their knowledge of the discipline.

Opening up review will enable as many parties as possible to monitor the peer review process. Participants will not be constrained by professional allegiances. If successful, open peer review will resemble a scholarly debate — an open playing field where everyone participates in a common conversation, whether they are in academia, industry, or the public sector. This will not only inform the patent examination process, but also illuminate broader scientific debates.¹⁵⁷

The benefits of open review may extend beyond the process of patent examination. Open review promotes deliberation about issues of national importance, promoting social cohesion and good citizenship.¹⁵⁸ Engaging the scientific community in patent review promotes science education and science literacy. It puts scientific knowledge to work for public purposes and democratizes the national conversation about science and innovation.

Finally, open review increases public oversight over the regulatory process. It allows the public not only to vet but also to produce the information on which regulatory decisions are based. This is especially valuable in the case of patent examination because the examiner often does not possess the requisite information or understanding to make informed decisions.

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

157. Openness and independence are critical to effective scientific discussion. See, e.g., E. Donald Elliott, *Strengthening Science's Voice at EPA*, 66 *LAW & CONTEMP. PROBS.* 45, 46 (2003) (“[G]ood science is a chorus of independent expert voices that come together with sufficient coherence and force to constrain policy, structure debate, and influence policy.”) (footnote omitted).

158. See Reich, *supra* note 118, at 1631–32 (“[P]ublic 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*.”) (emphasis in original); see also Beth Simone Noveck, *Designing Deliberative Democracy in Cyberspace: The Role of the Cyber-Lawyer*, 9 *B.U. J. SCI. & TECH. L.* 1 (2003).

Unlike a traditional peer review solution, an open review process like Community Patent Review may be more expert and more participatory than both the status quo of patent examination and the closed systems of scientific peer review employed in other agencies. This model opens the policymaking process to more members of the scientific community and provides a platform to organize and evaluate their input.

E. Possible Questions

The incentives for open patent review and participation in the Community Patent Review pilot are clear and powerful. Nonetheless, the proposed system is a significant departure from years of patent practice. As a result, I anticipate criticisms and questions to which this Part will respond.

Could competitors use this system to misappropriate confidential business information, suppressing innovation?

The Supreme Court has stated,

the 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.¹⁵⁹

When an applicant files for a patent, it comes with the requirement of public information disclosure. Today, most applications are published eighteen months after filing. Even if the inventor is taking some risk with his disclosure, that risk is only of foregoing trade secret protection. The cost of disclosure to the inventor is small compared to the cost imposed on the public by a patent monopoly. If the patentee does not want to forgo secrecy or does not feel that the patent is meritorious enough to receive protection, he should not file for a patent. There is no added harm associated with facilitating research into the application, and, in fact, innovation might benefit from this forum for discussion of pending patent applications. Tellingly, many

159. *Brenner v. Manson*, 383 U.S. 519, 534 (1966).

companies have already consented to participate in Community Patent Review.

Could contributing prior art in Community Patent Review create the risk of increased liability for willful infringement?

Willful infringement imposes treble damages when an infringer deliberately copies another's patented invention.¹⁶⁰ However, knowledge of a pending application is generally insufficient to establish willfulness.¹⁶¹ Participation in the program occurs pre-grant, which likely implies that courts will not find membership in the Peer-to-Patent community probative of willfulness in later litigation.¹⁶² Penalizing participation in a public forum for researching prior art also contravenes the public policy of the patent system.

This proposal is too radical. How can the USPTO put the fate of innovators in the hands of the public?

The Community Patent Review pilot does not eliminate the USPTO, nor does it alter the substantive statutory standards used in reviewing inventions. It preserves the scheme that has been in place since 1952.¹⁶³ Open review merely augments that scheme with a non-expert institution akin to the jury system, a "radical" institution that has been used since the 13th century.¹⁶⁴

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

If people produce information that is useful to the examiner, their personal agendas are irrelevant. Having many participants in the process will dilute the effects of unconstructive users. In existing social

160. See *Chaparral Indus., Inc. v. Boman Indus., Inc.*, 697 F. Supp. 1113, 1124 (C.D. Cal. 1988).

161. See *State Indus., Inc. v. A.O. Smith Corp.*, 751 F.2d 1226, 1236 (Fed. Cir. 1985).

162. See Yeen C. Tham, Memorandum on Willful Infringement and Community Patent Review (Sept. 11, 2006), <http://dotank.nyls.edu/communitypatent/willfulinfringement.pdf> (last visited Oct. 8, 2006).

163. The examination system has remained largely unchanged since the Patent Act of 1952. See Christopher M. Holman, 5 J. MARSHALL REV. INTELL. PROP. L. 318, 318 (2006) (observing that the now-dormant Patent Reform Act of 2005 "would have constituted the most substantial and comprehensive package of patent law reforms since the Patent Act of 1952").

164. The use of a jury in English trials dates from 1215. Danny Danziger & John Gillingham, 1215: THE YEAR OF MAGNA CARTA 187 (Touchstone 2004) (2003).

reputation system, norms frequently evolve to safeguard the quality of participation.¹⁶⁵ We can expect something similar to happen here.

In addition, direct competitors might be prevented from rating a particular invention. It is unproblematic to require each participant to sign an affidavit representing that she does not have a conflict of interest. The National Science Foundation,¹⁶⁶ the National Research Council,¹⁶⁷ and the National Institutes of Health¹⁶⁸ all have well-established regulations and disclosure requirements to weed out conflicts among peer-review participants. The Community Patent Review pilot could institute a similar policy.

Won't allowing non-governmental persons to have input into the decision-making process decrease the system's impartiality?

You couldn't have a greater risk of bias than in the current system, in which a lone patent examiner rules on innovation without public oversight or review. The "wisdom of crowds" is generally more accurate and more objective than the judgment of one uninformed "expert."¹⁶⁹

Due to increased scrutiny, this program will effectively increase the standard of review during the application process. If instituted in widespread practice, wouldn't such a system cause fewer people to apply for patents?

If those patents that remain unfiled would not have survived the threshold of public scrutiny, then this is a positive development. The scientists, innovators, and inventors participating as contributing reviewers also rely on patents in their own work. While there are competitive economic interests that might create an incentive to submit challenging prior art, the collective economic interests of the community drive towards producing the best quality patents. Only those patents that satisfy the statutory criteria ought to be granted.

165. See *supra* note 152 and accompanying text.

166. See NAT'L SCI. FOUND., REPORT TO THE NATIONAL SCIENCE BOARD ON THE NATIONAL SCIENCE FOUNDATION'S MERIT REVIEW PROCES FISCAL YEAR 2005 14 (2006), http://www.nsf.gov/nsb/documents/2006/0306/merit_review.pdf.

167. See The Nat'l Acads., Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports (May 12, 2003), http://www.nationalacademies.org/coi/bi-coi_form-0.pdf.

168. See Nat'l Insts. of Health, NIH Conflict of Interest, Confidentiality and Non Disclosure Rules: Information for Reviewers of Grant Applications and R&D Contract Proposals (Jan. 12, 2005), http://grants.nih.gov/grants/peer/COI_Information.pdf.

169. See SUROWIECKI, *supra* note 136, at xv.

There are still an enormous number of patent applications.¹⁷⁰ If Community Patent Review is expanded, won't the workload be too great for these non-professional peer contributors?

The pilot does not ask laypersons to be patent examiners but merely to submit bibliographic information about that which they already know in their roles as scientists or innovators. Experts can quickly answer questions in their field that identify prior art. The system's division of work allows for small "chunks" of participation. Thus experts can make meaningful contributions to the community without devoting large blocks of their schedule to Community Patent Review. There are plenty of scientists, engineers, economists, consultants, and other professionals eligible to participate, especially given that the grant of a twenty-year period of exclusivity is so economically significant to the future of science and industry. If the National Science Foundation can tap the more than 50,000 natural scientists in the United States to review grant applications, the USPTO should be able to solicit the participation of a vastly wider network of experts — including those scientists for whom funding depends on revenues from lucrative university patents.

If Community Patent Review were expanded from a pilot to a more widespread system, there is also no need to ask the public to review every patent. Attention could be directed only where the examiners encounter difficulties with their searching.

"Rational ignorance"¹⁷¹ is intentionally built into the patent system. 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."¹⁷² Why invest in process review?

Mark Lemley's critique of ex ante reform did not consider the possibility that additional prosecution costs could be borne by a "third party" to the proceedings. Thus by engaging an outside community, Community Patent Review sidesteps this problem. At the same time, the program may reduce the costs of litigation by ensuring that patents

170. Inventors filed 409,532 patent applications in fiscal year 2005. See ANNUAL REPORT, *supra* note 12, at 119 tbl. 2.

171. Lemley, *supra* note 37, at 1495.

172. *Id.* at 1531; *see id.* at 1510–11 (“[S]ociety ought to resign itself to the fact that bad patents will issue, and attempt to deal with the problem ex post, if 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.”) (footnote omitted).

issued with public scrutiny are stronger and more litigation-resistant. Furthermore, this critique ignores the Supreme Court's clear statement in a seminal patent case that "primary responsibility for sifting out unpatentable material lies in the Patent Office" and "[t]o await litigation is — for all practical purposes — to debilitate the patent system."¹⁷³ If the examiner, inventor, and the public can share the burden, more information might be introduced into the process.

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

Building the community to participate in patent examination is the greatest challenge. Even with the best technology and most considered process, without contributors the system will fail.

Fortunately, recruitment for the pilot has already begun. All the companies that have volunteered their patents for peer review, including IBM and Microsoft, have committed to have their employees participate as peer reviewers. 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. Moreover, the pilot will focus on Technology Center 2100,¹⁷⁴ which concentrates on software-related patents.¹⁷⁵ This should engage a large community of software developers with a strong spirit of volunteerism. There are also many within that community who oppose patenting¹⁷⁶ and will want to participate in an effort to defeat bad patents.

Further recruitment initiatives will solicit participation from industry, universities, and academic technology transfer offices. Graduate students will want to participate in order to increase their standing in the scientific community and gain recognition in their communities of practice.

Finally, it is worth noting that over one million Wikipedia entries are managed largely by only one thousand administrators.¹⁷⁷

173. *Graham v. John Deere Co.*, 383 U.S. 1, 18 (1966).

174. For a list of the USPTO Technology Centers, see USPTO, Patent Technology Centers, <http://www.uspto.gov/web/info/pat-tech.htm> (last visited Nov. 22, 2006).

175. See Patent Technology Center 2100 Contact Info, <http://www.uspto.gov/web/info/2100.htm> (last visited Nov. 20, 2006).

176. See, e.g., Richard Stallman, *Patent Absurdity*, GUARDIAN UNLIMITED, June 5, 2004, <http://technology.guardian.co.uk/online/comment/story/0,12449,1510566,00.html>.

177. See Wikipedia, Wikipedia: List of Administrators, http://en.wikipedia.org/wiki/Wikipedia:List_of_administrators (as of Nov. 19, 2006, 16:30 GMT).

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

Many large systems like the program contemplated here have operated successfully online. Their success stems from having well-thought out practices that allow 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 millions of auctions every day,¹⁷⁸ then this modest pilot can be built, leaving opportunities to evolve and improve over time.

Don't small inventors stand to suffer from this process? Won't this increase the costs of obtaining a patent and the risk that it will not be granted?

Small inventions receive equal consideration in this system and even the work of unknown inventors may receive useful attention from the community. While some patent applications may be of greater interest to the public than others, public willingness to participate is not contingent upon the size of the inventor. This process does not delay substantive examination. To the contrary, participation speeds up consideration by allowing all applicants, regardless of size, to be reviewed first. Applicants are not obligated to review every piece of information found by the public nor are they required to amend their information disclosure statements before the USPTO. The Community Patent Review system functions as an adjunct search service for the examination. It does not alter the obligations of the patentee. The USPTO will provide this assurance to consenting applicants who participate in the pilot.

Can this process be privatized?

Possibly. A peer review process will be most effective and create the greatest incentives for participation if it meaningfully connects to administrative process. A direct connection to a legal decision-making process confers legitimacy and relevance on peer review. At the same time, private third parties are already offering services to discuss and deliberate about granted (and, increasingly, published) patents.¹⁷⁹ It is

178. See eBay: The World's Online Marketplace, <http://pages.ebay.com/aboutebay/thecompany/companyoverview.html> (last visited Nov. 15, 2006) ("On any given day, there are millions of items available through auction-style and fixed-price trading.")

179. See, e.g., WikiPatents — Community Patent Review, <http://www.wikipatents.com> (last visited Nov. 19, 2006); About the CAMBIA Patent Lens, <http://www.patentlens.net/daisy/patentlens/patentlens.html> (last visited Nov. 19, 2006); EFF: Patent Busting Project, <http://www.eff.org/patent/> (last visited Nov. 19, 2006).

possible that these approaches can be combined. The Peer to Patent system might act as a conduit through which third-party data could be channeled to the USPTO.

If we implement open review, what happens to the prosecution history? How will a record be created for litigation?

The Peer to Patent process creates a strong, robust, and informed record for review. With the entire peer review process conducted online, it can be recorded and archived in its entirety, making information also accessible to the inventor. Only information transmitted to the examiner will form part of the record, just as in any examiner search.

VI. CONCLUSION: INSTITUTIONAL COMPETENCE AND PATENT REFORM

Patent reform has been incremental at best, with no major changes to the examination system since the Patent Act was enacted in 1952. Open review presents an alternative avenue for legal reform by enhancing the institutional competence of the USPTO. This proposal focuses on the institution that makes the decisions, employing technologically-enhanced information and communications practices to improve its work. Instead of seeking reform through the slower mechanisms of judicial review, this proposal addresses its administrative law antecedents by revolutionizing the process of patent examination.

Moreover, even if we were to change the legislative standards by which patent determinations are made, without adequate information to enable good decisions, meaningful reform is not possible. Agencies depend on good information to do their work — whether it is determining patentability or air quality standards — and the Patent Office currently lacks the institutional mechanisms and culture to benefit from outside expertise.

The pilot program could also spur empirical and data-driven reform.¹⁸⁰ The legal profession often prefers “anecdotes to tables,”¹⁸¹ and legislative change is not necessarily supported by empirical data.¹⁸² Introducing a verifiable process makes it possible to test its

180. Cf. David A. Hyman, *An Outsider Perspective on Intellectual Property Discourse*, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 275, 278 (F. Scott Kieff ed., 2003) (discussing evident lack of concern about the dearth of empirical evidence in legal scholarship).

181. *Id.* at 279.

182. See David A. Hyman, *Lies, Damn Lies, and Narrative*, 73 IND. L.J. 797, 836–37 (1998) (noting that anecdotal evidence can be exploited to produce legislative change that is unjustified by empirical data).

impact on the patent system and ascertain if the measure truly promotes the progress of the “useful arts.” Rather than prompting prolonged guesswork as to which legal reforms will address the patent crisis — wondering whether a change in the standard of judicial review or a reform of the obviousness standard will, in fact, improve patent quality — open patent review will both create and stimulate progress. Information from the pilot can be used to inform examination and see what works and what does not. We can then lobby Congress for more thoroughgoing legislative change, armed with concrete data. Furthermore, the results of this program will help us develop new models and new technologies that will solicit public 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. Instead of one examiner, an application can have a thousand! The new generation of social software might not only make it easier to find friends but also to find expertise that can be applied to legal and policy decision-making.¹⁸³ This way, we can 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 Thomas Jefferson complained.¹⁸⁴

183. See CENTER FOR AMERICAN PROGRESS, PROGRESSIVE PRIORITIES: AN ACTION AGENDA FOR AMERICA 253 (2005), available at http://www.americanprogress.org/projects/progressivepriorities/prog_priorities.pdf.

184. See Walterscheid, *supra* note 7 (noting that Jefferson was “not convinced” that the Patent Act of 1793 was “either desirable or particularly useful”). Along the same lines, Irving Wladawsky-Berger, IBM Vice President of Technology and Strategy, said of the U.S. Patent Office, “[A]ny idiot can get a patent for something that should never be granted a patent.” Robert McMillan, *IBM Exec: U.S. Could Learn from EU, China Patent Policy*, INFOWORLD, Apr. 7, 2005, available at http://www.infoworld.com/article/05/04/07/HNpatentpolicy_1.html.