Collaborative approach: Peer-to-Patent and the Open Source movement

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Abstract

The patenting of software has increased significantly. Regardless of any personal bias as to the existence of software patents, it is a trend that is unlikely to end anytime soon. As a result, the open source movement may be threatened by the proliferation of non-meritorious or overly broad patents. Peer-to-Patent provides a means for mitigating the limitations that may be placed upon the open source community by software patents, as the program allows the open source community to participate in the peer review of pending patent applications. Members of the open source community are knowledgeable, interested parties with a unique stake in the software patent debate and thus are capable of making a significant contribution to improving the current system.

Keywords

Patents, Free and Open Source Software, Peer-to-Patent, Patent proliferation

I. Introduction

The United States Constitution gives Congress the sole power to legislate. While it continues to be an issue of contention,\textsuperscript{2} our government has seen fit to allow the delegation of legislative power to administrative agencies in the executive branch.\textsuperscript{3} One of the main justifications for doing so is that agencies tasked with the administration of a particular area are uniquely able to promulgate rules that are tailored to suit the needs of the field.

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\textsuperscript{2}See Field v. Clark, 143 U.S. 649 (1892) (“That Congress cannot delegate legislative power to the President is a principle universally recognized as vital to the integrity and maintenance of the system of government ordained by the constitution.”)

\textsuperscript{3}See J.W. Hampton, Jr. & Co. v. United States, 276 U.S. 394 (1928) (“If Congress shall lay down by legislative act an intelligible principle to which the person or body authorized to fix rates is directed to conform, such legislative action is not forbidden delegation of legislative power.”); See Amalgamated Meat Cutters v. Connally, 337 F.Supp. 737 (1971).
Such is the case with the United States Patent and Trademark Office (USPTO). The USPTO is, among other things, tasked with maintaining our system of patents. It is allowed to promulgate rules, so long as the rules are procedural in nature, because it is considered to be in the best position to make those decisions. However, if the USPTO is expected to be expert in the administration of the patent system as a whole, as a justification for allowing their existence, so too should they be held to that standard in every aspect of the patent system.

As it turns out, there are a number of considerations that limit the extent to which examiners at the USPTO can be the experts needed for the proper examination of patent applications. For example, examiners are only required to hold a bachelor’s degree in an accepted scientific or technical field, whereas many patent applications are filed by inventors holding advanced degrees. That is not to say that education is the sole means of attaining expertise. However, the divergence of academic degrees between examiner and applicant evidences the extent to which an examiner may not be knowledgeable about a specific application of technology.

**Examination**

When an application for a patent is filed, it is assigned to a class and an examiner in that class is tasked with comparing the claimed invention against all of the scientific and technological antecedents that touch on the claimed invention. A person is entitled to a patent unless the claimed invention is not novel⁴ or would have been obvious to a person having ordinary skill in the art (PHOSITA).⁵ That is, if a claimed invention is not anticipated by another invention (and therefore novel) and not an obvious extension of an existing invention or combination of inventions (and therefore non-obvious), a patent should be granted. These antecedents are known as prior art and this process of comparison is one of the most important aspects of patent examination.

Examiners at the USPTO are restricted in what resources they have available to them when searching for prior art. As a result, they do not have access to all the prior art that they need. Innovation does not always occur in an organized, documented manner. A significant amount of prior art goes un-catalogued and resides outside of the examiner’s reach. This information deficit makes it difficult for any examiner, regardless of ability, to make the correct determination as to the patentability of a claimed invention.

**Implications for the Open Source Community**

The state of patenting in the software industry is controversial, to say the least. There are many arguments as to whether software constitutes patentable subject matter to begin with. This issue was most recently visited by the Court of Appeals for the Federal Circuit’s (CAFC) decision in In re Bilski.⁶ Many observers had hoped that the CAFC would reject as patentable subject matter business methods and software.⁷ However, while the court did put forth the “machine or transformation” test as a way of limiting patentable subject matter, it made no indication that software or business methods would fail to qualify under the new test. Thus, the patenting of software remains of real concern for the open source community, as open source technology benefits from unrestricted use of prior technology.

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⁷ To be clear, the facts in Bilski dealt specifically with the patentability of a business method. However, many groups filed amicus briefs debating the patentability of software in the hopes that the CAFC would take software implications into consideration before announcing any new test for subject matter patentability.
Open source technology increasingly permeates the mainstream. Any person that comes in contact with the Internet is likely utilizing software that contains some form of open source code. An open source product is characterized by the ability of others to use, copy, modify, and distribute the original source code, as allowed under licensing terms granting broad, royalty-free copyright permissions. This form of innovation, however, runs counter to the justification for patent protection, which gives an inventor exclusive rights to the invention for a period of 20 years during which time no other person within the patent granting jurisdiction can utilize the patented technology without the express consent of the inventor. As the patenting of software continues, the implications for the open source community are obvious: the more software is patented the less software is available for further innovation. Beyond this concern of software patenting effectively handicapping downstream innovation lies another major concern that open source software may be co-opted by an entity seeking to commercialize a product that contains open source code.

The ideal solution, from the perspective of the open source community, would be the elimination of software patenting as a whole. But, given the CAFC’s recent decision in In re Bilski and the present posture of the European Patent Office, this is unlikely to happen any time soon, if ever. The concerns of the open source community, however, may be allayed through participation in Peer-to-Patent.

II. Peer-to-Patent

Peer-to-Patent was launched by New York Law School in cooperation with the USPTO; an historic initiative to open the patent examination process up to public participation. The program launched as a one year pilot on June 15, 2007, but showed enough promise after the first year to be granted a one year extension to further investigate the effects of public participation on the patent system. The program, upon consent of the inventor, posts published patent applications on the Peer-to-Patent website for 16 weeks, during which time any member of the public may review the application, discuss the application with others in the community, submit prior art relevant to the patentability of the claimed invention, denote the relevance of the prior art, and annotate prior art submitted by others to make the prior art more readily useful. Peer-to-Patent then forwards the best prior art, as rated by the community, to the USPTO for use by examiners in the actual examination of the patent application.

The pilot was implemented in Technology Center 2100 (TC 2100) of the USPTO, an art unit covering computer architecture, software, and information security. For the second year of the pilot, the program was expanded to also include patent applications pending in class 705, Business Methods and E-Commerce.

The area of software patents was an optimal test bed for piloting Peer-to-Patent, as it suffers greatly from the problems associated with the information deficit. As a result, Peer-to-Patent, in its present form, bears directly upon the open source community. The closed databases of prior art that examiners at the USPTO have access to do not contain evidence of many open source projects that would otherwise qualify as prior art were they accessible nor are examiners generally familiar with software developments that occurred prior to the aggressive patenting of software in the last 15 years. While the ultimate decision of patentability still lies with the USPTO, Peer-to-Patent has shown not only that people aware of open source projects are willing to participate, but also that it

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8 See Tiller and Fontana, Brief of Amicus Curiae Red Hat, Inc., In re Bilski (2007) (“A good example of an open source project is the Linux operating system kernel, which is one of the most commercially-important open source programs and which is a core component of Red Hat’s flagship product, Red Hat Enterprise Linux. The Linux kernel contains several million lines of source code. A worldwide community of hundreds of contributors, including many employees of Red Hat, collaborate via the Internet in developing and improving the Linux kernel.”)
is a useful tool for getting open source documentation in front of the examiner. For example, a reviewer on the Sun Microsystems patent application *Method and Apparatus for Delivering Device Drivers* submitted a paper written by Klaus Knopper, an electrical engineer in Germany, entitled *Building a self-contained auto-configuring Linux system on an iso9660 filesystem.* Mr. Knopper’s company, Knopper.net, focuses on customized open source solutions while Mr. Knopper himself also works with developers on a freelance basis on a variety of IT projects based on free software. It is unlikely that documentation of Mr. Knopper’s open source product would have been accessible to an examiner at the USPTO.

This example also demonstrates the importance of obtaining an international field of participants, as the relevance of prior art is unaffected by national borders. To date, Peer-to-Patent has been visited by over 70,000 unique visitors in 157 countries/territories. While software patenting is more prolific in the U.S. than anywhere else, U.S. patents nonetheless affect the software industries and patenting trends in other countries. For this reason alone it is important for the international community to participate in a program that seeks to improve patent quality by way of reducing the number of non-meritorious patents that are granted.

**Collaboration**

Members of the open source community are accustomed to working from a collaboration-based approach. Developers cooperate to write code, identify and diagnose problems, and customize software to a wide array of applications. This proclivity towards working together is easily adaptable to the work needed for participating in Peer-to-Patent.

A significant problem with patents and patent applications is that they are written in language that is difficult to read for anyone who is not a patent attorney. Recognizing that the average contributor is not a trained patent attorney, Peer-to-Patent provides a discussion board for each patent application where reviewers can communicate and help each other understand the claims of patent application. Reviewers are also able to submit items for research and rate and annotate the prior art references submitted by other members of the community. Thus, much like open source projects, reviewers solve problems as a group. As a collaborative project, the success of Peer-to-Patent does not require that each person that participates be an expert capable of finding, digesting, and submitting relevant prior art. The following case illustrates the collaborative approach.

One of the first patent applications to undergo review on Peer-to-Patent and receive an office action from the USPTO was a Hewlett-Packard application for *User Selectable Management Alert Format.* One of the authors of this article, Christopher Wong, holds a BSBA in Information Technology. By the time Peer-to-Patent launched and the HP application was available for review, Wong was nearly 3 years removed from any software engineering or computer programming courses he had taken during his undergraduate years. He did, however, recognize the subject

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11 The ability to annotate a prior art submission is itself a significant improvement to the current system. In the US, a person wishing to submit a prior art reference on a patent application may only do so for a limited time after the patent application has been published, and must pay a fee. Because the submitter may not make any annotations to the prior art, they leave to chance that the prior art will get in the hands of the proper examiner and that the examiner will utilize the prior art in the intended way. See Manual of Patent Examining Procedure, 37 C.F.R §1.99, (updated July 2008) available at http://www.uspto.gov/web/offices/pac/mpep/documents/appxrr_1_99.htm.
matter of the patent application, even if not completely understanding it. He then performed a cursory search of the Internet and found Intel’s Active Management Technology (AMT) site. Not knowing exactly how to use the prior art, but recognizing that it might be relevant, Wong then uploaded the product documentation URL to Peer-to-Patent as a research item, with the note, “[a]nother example of management alert format.”

Roughly two months later, with about 2 weeks remaining to review the patent application, Steven Pearson, a senior engineer at IBM who had been facilitating discussion on the discussion board, posted a comment for his fellow reviewers, which read in part, “I think I’ll move one of the Intel AMT “research” references to the prior art list, as it is in the neighborhood even if not dead on for this application and we haven’t maxed out yet.” Pearson then submitted a product guide for Intel’s AMT as prior art, filling out the submission form with the detail and clarity that Wong could not. Pearson then annotated the prior art with directions to a specific page and figure within the product guide. In total, 30 people took part in the review of the HP application and submitted 9 prior art references for use by the USPTO in determining the patentability of the claimed invention.

On February 8, 2008, the USPTO concluded its examination of the HP application and mailed its first office action on the merits. In the office action, the examiner relied upon the non-patent literature supplied by Pearson (in combination with another patent application filed prior to the HP application) in rejecting all 21 of the application’s claims as being obvious. In reaching the decision, the examiner specifically referred to the same figure and section within the AMT product guide that Pearson had noted in his annotation.

Observers have expressed motive as a prominent concern in allowing the public to participate in the examination of patent applications. Peer-to-Patent emphasizes the idea that relevant prior art is relevant regardless of impetus. As mentioned above, in this case, the prior art reference cited in rejecting the HP application was the Intel AMT product guide submitted to Peer-to-Patent by an IBM software engineer. Notwithstanding the potential benefit to IBM in defeating the claims of the HP application, it might also be fair to suggest that in doing so, the reviewer aided in protecting the intellectual property of Intel.

More importantly, the above example illustrates the type of participant that Peer-to-Patent is seeking. Though successfully reviewing a patent application likely necessitates more than one examiner with more than 20 hours to spend on it, it does not require a critical mass of the most expert members of a given field. The project leadership recognizes that few participants will have the time to perform all of the functions of examination from start to finish. What is necessary, is a community of reviewers comprised of both those who have the ability to simply recognize that a prior art reference might be useful, and those with the expert skill needed to explain specifically why, and how, a prior art reference should be used. Members of the open source community likely fall into both categories, as many have significant historical knowledge of the field of software development and others have the practical expertise and know-how that can only be obtained by working intimately with such cutting-edge projects as those associated with the open source movement.

Collaborative approach: Peer-to-Patent and the Open Source movement

Growth

Thus far, 56 applications that have undergone review on Peer-to-Patent have received first office actions. In 15 of these office actions, the examiner cited prior art references submitted through Peer-to-Patent as a basis for rejecting the patent application.

The success of Peer-to-Patent has not gone unnoticed. Many other national patent offices suffer from the same problems as the USPTO, namely, a significant backlog of applications, lack of time for examination, deficiency in personnel, and gaps in the accessibility of information. These agencies also understand the need for taking action. In 2008, the Japan Patent Office (JPO), with guidance from the Peer-to-Patent team, launched their version of Peer-to-Patent, called Community Patent Review. The Peer-to-Patent leadership hopes to launch a pilot with another national patent office later this year. The Center for Patent Innovations at NYLS, home to Peer-to-Patent, has also had preliminary discussions with the European Patent Office, the Canadian Intellectual Property Office, and IP Australia to adapt the Peer-to-Patent system for their respective patent offices.

Up until now, Peer-to-Patent has been limited in scope to U.S. patent applications pending in USPTO Technology Center 2100. If the program were to be implemented to cover all subject matter, it would need to handle a significantly greater number of patent applications, as last year the USPTO received over 450,000 patent applications.

III. Scalability

Given the above room for growth, there is some concern as to the scalability of the program. The open source community is, therefore, an important community to engage. In order to explore the scalability of the Peer-to-Patent model of public participation we must first analyse the extent to which the Peer-to-Patent pilot has been successful, thus far, in mobilizing contributors and utilizing their collective expertise. The measure of success informs the degree to which the project can be readily enlarged to accommodate more patent applications and its implementation to other patent systems around the globe.

The following data was assembled by the Peer-to-Patent team and provides insight into those dimensions of the Peer-to-Patent interface that show promise for scalability, and those that need to be improved. Generally, the figures illustrate various trends concerning the traffic to the website and the interaction of users with the project. Based on our conclusion that Peer-to-Patent is currently driven by a rather robust and loyal base of peer reviewers, we have determined that an essential component to enhancing the project’s effectiveness rests on the ability to both solicit and retain more peer reviewers.
Data was collected from five different time intervals, spanning the life of the pilot, from June 15, 2007, to March 20, 2009. These intervals include data collected after one month, one year, one year and six months, total time, and a focus interval (“focus group”) consisting of data collected in the three months of December 9, 2008, to March 20, 2009. This specific focus interval was implemented in order to track any changes in traffic patterns emerging during a time period in which the Peer-to-Patent project had received valuable publicity by way of USPTO solicitation, and various media outlets, included articles about Peer-to-Patent, such as BusinessWeek and Ars Technica. The most informative visitor trends, and the ones we will focus on in this article, were established within the following categories: visitor loyalty, depth of visit, and traffic sources.

**Visitor loyalty**

Since its launch, Peer-to-Patent has cultivated a committed peer reviewer base that uses the site regularly and thoroughly. For instance, the number of individual users who have visited the website 9-50 times has increased from 816 (4.2% of visitors) in the first month to 6347 (6.6%) in total. This shows that there is a significant proportion of reviewers who return to the website and have some interest in keeping up to date as to site activity. Those who visit the site 9-50 times are likely spending their time monitoring the posting of new patent applications, discussing patent applications, and submitting prior art.

![Visitor Loyalty](image)

*Fig. 1: Visitor Loyalty by Number of Visits.*
During the first year of the project, not a single visitor used the site more than 50 times. Within the six month period directly following the one year mark, 1393 users had reached 50+ visits. By March 20, 2009, 1562 individual visitors had used the website 50+ times, or 1.6% of all visitors. Of this 1562, the focus group consisted of 739 users. In other words, 6% of all visitors during the last three months of data collection had used the site more than 50 times. These figures provide an illustration of the current success the interface is having in stimulating the self-selection of participants, retaining these participants, and developing an overall “human database” of interested citizen-experts.

Traffic

Direct traffic represents visitors arriving from bookmarks and URL inputs, so it follows that users accessing the site through these means are interacting with Peer-to-Patent on a consistent and frequent basis. The percentage of direct traffic was the most stationary of the three sources throughout the testing period, accounting for 26% of all traffic to the website during the first month and 33% of all traffic during the focus period. The stability of this percentage is another demonstration of the project’s ability to solicit and maintain a committed collection of peer reviewers.

Search engine traffic represents the visitors arriving at the website by way of a search engine results page. Visitors approaching a search engine likely have a previously formed interest in
online community participation in software and technology development, which they then act upon by searching for Internet content. However, another theory is that these visitors are using a search engine as a means to casually and intermittently check-in with the ongoing Peer-to-Patent project, looking for software applicable to their field. This kind of traffic is opposite to typing in a URL or adding a bookmark, the means through which Peer-to-Patent’s dedicated peer reviewer base is likely to access the site. Whether visitors are acting on already formed interests or just checking-in, both are methods by which the open source community is likely interacting with Peer-to-Patent. The percentage of search engine traffic showed the most marked increase of the traffic sources, accounting for only 2% of all traffic to the website during the first month and 32% of all traffic during the focus period. This suggests a growing interest in Peer-to-Patent among those already involved or interested in software development and community participation, but not necessarily involved with the patenting of software (i.e. not part of the group that would be accessing the site directly and frequently). We interpret this as bearing great potential for the incorporation of more participation from the open source community, as collaboration-based participation is the bedrock of the open source movement and Peer-to-Patent alike.

Traffic from referring sites represents visits originating from clicking a link on a website, not Peer-to-Patent. During the first month, 72% of all traffic to the website could be attributed to referring sites. This number can be explained by the initial influence of Peer-to-Patent’s progenitor website, which included information and links for the then developing Peer-to-Patent project. During the focus interval, the percentage of visitors arriving from referring sites dropped to 36% of all visitors, a number that shows a continued presence of Peer-to-Patent in articles and links residing on other websites, with a diminished reliance on referrals from the Peer-to-Patent information site.

When inspected as a whole, a revealing trend emerges. As the project evolved, the ratio of the traffic sources became balanced, culminating in a roughly equal distribution among the three sources. The parity in traffic sources indicates two things. First, in terms of scalability, Peer-to-Patent is displaying the ability to be readily enlarged in all directions. Second, in terms of effectiveness, Peer-to-Patent has been successful in increasing the diversity of our visitor pool, in such a way that the site is receiving traffic through various channels of interest. This diversity of community should be highly regarded with respect to collaboration-based projects.

**Areas for Improvement**

While the numbers indicate a dedicated core of peer reviewers, one area in need of improvement is visitor depth: the number of pages on the site accessed by a user in a single visit. After the first month of the project, 44.4% of all visits yielded only a single page. In other words, 44.4% of visitors left without any interaction. The percentage continued to rise to 51.75%, 57.8%, for one year and the focus group, respectively. On average, 53.5% of visitors ended their visit after viewing one page. The notion that more than 50% of visitors are abandoning the website without a single click suggests a huge market for potential peer reviewers. In response, the Peer-to-Patent development team is working to release a new landing page specifically designed to increase site activity beyond the front page.

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19 This site, referred to as the DoTank site, has continued in existence, serving as the information center for all things Peer-to-Patent. See The Peer-to-Patent Project: Community Patent Review, available at http://dotank.nyls.edu/communitypatent.
Within the focus group, the bounce rate is the highest among those visitors entering the website from a non-patent related referring site. For instance, the top referring site within the focus group was huffingtonpost.com. During this time, Peer-to-Patent received 456 visits originating from huffingtonpost.com, 95% of which were from first time visitors to Peer-to-Patent. The bounce rate for these visitors was 66%, while those visitors who did not bounce only interacted with the site for an average of 2 pages. Similarly troublesome were the visitors from wired.com. Following a story on Peer-to-Patent, wired.com sent 91 visitors, 98% of which were first-time visitors. The bounce rate for this group was 87%, with the other 13% interacting at an average 1.2 pages. Compare these two ‘passing interest’ pools of visitors to that of the 151 visitors coming from a link on uspto.gov. Of these 151 visitors, only 61% were new and only 27% bounced. The other 73% interacted with the website at an average of 8.6 pages.
The obvious conclusion here is that those who end up on Peer-to-Patent are more likely to remain on the site and interact with the site if they are coming to the website with a purpose. Increasing participation and reducing the rate of attrition depends in large part upon the project leadership’s ability to demonstrate to different communities exactly why they should care about the goals of Peer-to-Patent. In order to do so, a community needs to understand how patenting affects their industry. The open source community, more so than many other communities of practice, understands the implications of software patenting on the open source movement. As such, it is a population that can readily contribute to the cause of increasing transparency through collaboration and a population that Peer-to-Patent needs to engage.

IV. Conclusion

Software patents are far more prolific in the US than any other country. However, while other national patent offices are more sceptical than the USPTO when it comes to recognizing computer software as patentable subject matter, software patents are still not unheard of.20 Regardless of where software patents issue, they have an effect upon the software industry as a whole. As a

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20 While Article 52(2)(c) of the European Patent Convention states that computer programs are explicitly ineligible for patents, the Board of Appeals of the European Patent Office has determined that when incorporated into a machine or a process that is itself patentable, the resulting system or process of operating a computer can be protected by patent. See European Patent Convention, art. 52, Dec. 13, 1970, E.P.C. 1973; see also IPR Helpdesk, CIP Programme, DG Enter. and Indus. of the European Comm’n, Patentability of Computer Programs (2005), http://www.ipr-helpdesk.org/documentos/docsPublication/html_xml/8_patentabilityComputerPrograms%5B0000001159_00%5D.html. For the Board of Appeals of the European Patent Office decision, see Case T-0928/03–3.5.01, Konami Co., Ltd., E.P.O. (June 2, 2006), available at http://legal.european-patent-office.org/dg3/pdf/t030928eu1.pdf.
result, all those who have an interest in the software industry also have an interest in maintaining the integrity of that industry.

One way of doing so is to participate in a process that assuages the concerns of litigation over open source products by ensuring that if software patents are to be issued (as it appears is the case), they will be issued only to those inventions that truly demonstrate innovation in the field of computer software. The open source movement depends upon the examiner’s ability to defeat non-meritorious or overly broad claims within pending software patent application. By helping to provide patent offices with relevant prior art that would otherwise go unnoticed, the open source community can assist in safeguarding the very foundation upon which it is built. Peer-to-Patent is the path for doing so.

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