Decoding the Digital Fortress

An Analysis of Proposed Measures for Enhancing Software Patent Quality

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ABSTRACT

Software and computer-related technologies have become major players in the U.S. patent and judicial systems, and as a repercussion software-related patents have largely been held invalid in recent years when challenged. This portrays a larger underlying issue of just how many low-quality software patents have been, and are continuing to be, granted. Many enhanced patent quality advocates believe this issue is of utmost importance and must be promptly addressed, and as such industry experts as well as the U.S. government have intervened to offer suggestions and solutions for these concerns. This paper will discuss the role of software and high-tech patents in the U.S. patent system as well as the significance software patent quality holds in the U.S. patent system, judicial system, economy, and in various industries. Additionally, this paper will address the current initiatives and measures undertaken by the USPTO and the government, focus particularly on the role played by software patent clarity and 35 U.S.C. § 112 requirements, and analyze what solutions experts propose could further be done to address these problems.

INTRODUCTION

In the United States there is ongoing debate over the "quality" of software-related patents and whether such factors as lax examination or lack of standard terms and proper definitions are responsible for an overabundance of low-quality software patents.[1] This paper aims to analyze this controversy by focusing on one of the most important supporters of improving patent quality, the United States Patent and Trademark Office (USPTO), since it is in the position of changing practices and implementing new measures in order to meet the demands of ensuring only high-quality software patents are granted. Additionally, this paper will: discuss why software patents tend to be of poor quality and what could be done to improve this; focus on 35 U.S.C. § 112 and the requirement of definiteness of claim language in relation to how applicants assemble their claim structure as well as its effect on USPTO policies and procedures; discuss the influence § 112 may have on software patent quality; explore the existing practices and measures adopted by the USPTO and government initiatives to address patent quality issues; and provide an overview of what experts in the technology industry suggest should be done to achieve better software patent quality and prevent further rises in litigation and findings of software claim invalidity.

BACKGROUND ON SOFTWARE PATENT QUALITY

Generally speaking, a "good" patent will be one that at least "satisfies all of the statutory conditions of patentability," or in other words it is one that is found to be valid if and when it is challenged.[2] However, from recent GAO reports and studies on patent litigation it appears many

[1] This paper will use the term "software" patent to refer to the sector of technology encompassing a majority of high-tech patents that are the focus of this paper.

[2] Christi J. Guerrini, *Defining Patent Quality*, 82 Fordham L. Rev. 3091, 3098 (2014). *See also* Bruce Berman, *The Puzzle That is Patent Quality*, WIPO Magazine (Aug. 31 2015), http://www.wipo.int/wipo_magazine/en/2015/04/article_0004.html (stating there are no "bad" patents, only "valid and invalid ones . . . or those that have been issued but do not withstand scrutiny").

software patents fall into the category of a "bad" patent because they are deemed invalid when challenged.[3] There are various factors underwriting why software patents are largely being found invalid. For instance, a recent GAO report stated the USPTO has an "absence of standard terms" for examiners and applicants to rely on, which is especially challenging for software-related applications.[4] If there is a lack of standard terms available then there will be applications with indefinite claims, and thus as a matter of course there will be § 112 issues and software patents with unclear and overly broad claims will be granted, which has been the situation presented over recent years. These unclear and overly broad patents tend to be held invalid, but how then do we prevent these "bad" patents from popping up in the first place? Before we can analyze how "bad" software patents cause disorder to the U.S. patent system, we must first establish a basis for why they are significant and how they are affecting various technologies and industries.

I. The importance of patent quality in relation to software patents.

A strong patent system is vital to innovation in the U.S., thus it logically follows that granting high-quality patents is also essential because they "enable certainty and clarity of rights, which fuels innovation and reduces needless litigation."[5] The patent system further supports millions of jobs in innovation-centric sectors.[6] In recent years computer-implemented technology, such as software, has been a significant contributor to the U.S. economy contributing approximately half a trillion dollars annually.[7] However, there are also complex trade-offs that

[3] The author acknowledges there may be several ways to define and address "patent quality" within the industry, but has deliberately decided to address the issue only in terms of patent validity and enforceability when litigated.
[4] U.S. Gov't Accountability Off., GAO-16-479, Patent Office Should Strengthen Search Capabilities and Better Monitor Examiners` Work 19 (2016).
[5] U.S. Patent & Trademark Office, *Enhanced Patent Quality Initiative*, http://www.uspto.gov/patent/initiatives/enhanced-patent-quality-initiative-0 (last visited Oct. 4, 2016).
[6] Ryan Davis, *GAO Says Time Pressure At USPTO Leading To Poor Patents*, Law 360 (July 20, 2016, 7:37 PM), http://www.law360.com/articles/819570/gao-says-time-pressure-at-uspto-leading-to-poor-patents.
[7] John R. Harris, *The Patent System is Under Assault--Startups, Should You Care? Ten Things About Patents that Startups Need to Consider*, 44 AIPLA Q. J. 27 (2016).

occur within the system in an effort to balance innovation which is vital to our patent system and competition between inventors which is integral to our economy.[8] It is possible there has recently been a shift in this balance, thus allowing certain software-related patents to grant which hinder innovation rather than encourage it.[9] Nevertheless, software patents continue to grow in popularity and use within the U.S. patent and judicial systems.

For instance, over recent years, software-related patent applications have become a major player in the U.S. patent system, in addition to having a tremendous global impact.[10] In fact, software-related technologies have had drastic increases in the number of U.S. patents granted over the last twenty years.[11] This could be in part because software patents occur in various technologies, even occurring outside of the software industry. For instance, this could include inventions found in the electronics, financial services, and automotive sectors.[12] With the rapidly evolving changes in technology and the expansive integration of computers into everyday life and business, software patents are becoming increasingly sought-after in the U.S. for many differing technologies and industries.

II. *Alice Corporation vs. CLS Bank International*.

Due to the current growth of software patents, the Supreme Court has grappled to define the boundaries of software patent protection, and this has added uncertainty and "undermined long

[8] U.S. Gov't Accountability Off., GAO-16-490, Patent Office Should Define Quality, Reassess Incentives, and Improve Clarity 2 (2016).
[9] *Id*.
[10] Warren K. Mabey, Jr., *Deconstructing the Patent Application Backlog: ...A Story of Prolonged Pendency, PCT Pandemonium & Patent Pending Pirates*, 92 J. Pat. & Trademark Off. Soc'y 208, 227 (2010) ("the granting of software and business method patents by the USPTO has a tremendous extraterritorial impact . . . in an interconnected internet world, software patents granted in one key jurisdiction will have a global impact").
[11] U.S. Gov't Accountability Off., GAO-13-465, Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality 12, 14 (2013).
[12] David J. Kappos, *Investing in America's Future Through Innovation: How the Debate Over the Smart Phone Patent Wars (Re)raises Issues at the Foundation of Long-Term Incentive Systems*, 16 Stan. Tech. L. Rev. 485, 489 (2013).

held beliefs on what can and cannot be patented."[13] In *Alice Corp. v. CLS Bank*, a recent and pertinent decision for the high-tech industry, the Supreme Court held that a claim is invalid under 35 U.S.C. § 101 if it (1) claims an abstract idea and (2) does so without claiming "something more" that transforms "the nature of the claim into a patent-eligible application."[14] This is troublesome to many in the software industry because of how broadly and unclearly the phrase "abstract idea" is used.[15] Nonetheless, *Alice* has established the criteria which software applications must meet despite the Supreme Court's refusal to clarify what constitutes an "abstract idea." Several cases since *Alice*, as well as the USPTO, have attempted to clarify the subsequent confusion by identifying what kind of software inventions are patentable and what examples constitute abstract ideas rather than technological innovations.[16] It is still unclear what impact these attempts will have long term; however, given recent rates and trends it is evident that clarity has yet to be achieved.

III. Rates and trends in software patent invalidity.

According to recent analysis, the number of software patents challenged and invalidated since the decision in *Alice* has accounted for much higher percentages than any other technology.[17] For instance, software patents accounted for 256, or 45.8 percent, of all challenged patents in the last two years, as well as for 45 percent of invalidated patents.[18] In contrast, the next highest ranked technology was business method patents which accounted for 125, or 22.4 percent, of the

[13] Amanda Ciccatelli, *Can the patent system keep up with digital tech?*, Inside Counsel (July 1, 2016), http://www.insidecounsel.com/2016/07/01/can-the-patent-system-keep-up-with-digital-tech.
[14] *Alice Corp. Pty. Ltd. v. CLS Bank Intern*, 134 S. Ct. 2347, 2357 (2014). *See also* Patrick T. Muffo, *Claim the Invention, not the Idea - why Recent Attacks on NPEs may not have Eliminated Software Patent Protection*, Intellectual Property Today (Feb. 1, 2015) (stating that *Alice* stands for the notion that "ideas are not patentable, but technological inventions are").
[15] *Id.*
[16] *Id.*
[17] Robert R. Sachs, *Two Years After Alice: A Survey of the Impact of a "Minor Case" (Part 1)* (June 6, 2016), www.bilskiblog.com/blog/2016/06/two-years-after-alice-a-survey-of-the-impact-of-a-minor-case.html.
[18] *Id.*

challenged patents, and only 26.3 percent of the invalidated patents.[19] Therefore it appears there is still a great level of uncertainty regarding patentability requirements for software patents, which may result in another flood of poor quality software patents emerging from the USPTO and entering the courts as technology continues to advance in this field.

These statistics parallel the findings of the GAO. According to a 2013 GAO report, "patents granted for software-related technologies [had] seen dramatic increases" over the preceding two decades, and in particular "lawsuits involving software-related patents accounted for about 89 percent of the increase in defendants" from 2007 to 2011.[20] According to another GAO report, the number of defendants in software-related patent infringement lawsuits increased from 38 percent in 2007 to 62 percent in 2015.[21] These statistics essentially reflect how easily software patents are infringed, and it is plausibly linked to the poor quality of the patents.

In addition to lawsuits filed in federal courts, accused infringers may file challenges to patent validity with the USPTO's Patent Trial and Appeal Board (PTAB).[22] There have been approximately 4,700 patent challenges filed in the PTAB from 2012 until March 2016, wherein 60 percent of those challenged patents were related to software and computer technologies.[23] Furthermore, the PTAB has only reached a final decision in approximately 30 percent of its cases and 75 percent of those final decisions resulted in unpatentable claims, thereby it is assumable based on the statistics that a large portion of these unpatentable claims belong to patents in the software and computer technologies.[24] Thus given the data available it appears software patents

[19] *Id.*
[20] U.S. Gov't Accountability Off., GAO-13-465, Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality 14, 21 (2013).
[21] U.S. Gov't Accountability Off., GAO-16-490, Patent Office Should Define Quality, Reassess Incentives, and Improve Clarity 18 (2016).
[22] The PTAB conducts administrative proceedings in order to determine whether patent claims should have initially been rejected due to their failure to meet statutory patentability requirements.
[23] *Supra* note 21 at 12.
[24] *Id.*

will continue to dominate the patent arena, and this reinforces the need for high-quality software patents in order to curb any further inflation of patent litigation.

EFFECT OF LOW-QUALITY SOFTWARE PATENTS ON THE SOFTWARE INDUSTRY

I. Patent Assertion Entities ("Patent Trolls").

Patent Assertion Entities (PAEs), alternatively non-practicing entities (NPEs) or "patent trolls," are entities who own patents merely to assert them against companies who use the patented technology to produce goods and services rather than actually producing goods or services themselves.[25] PAEs usually obtain software patents, which are exceptionally difficult to interpret, assert them against other companies such as startups or large corporations in order to settle for large sums of money, or alternatively to bring suit for patent infringement.[26] Surprisingly, lawsuits involving software patents accounted for 72 percent of all such infringement suits brought by PAEs.[27] This raises concerns over the clarity of such software claims because of how much their indefiniteness diminishes the notice given to the public on what actions do or do not constitute infringing behavior.

II. Impacts on small companies and startups versus larger companies.

Small companies are generally targeted by PAEs asserting software or high-tech patent infringement because they are usually users of the technology and they tend to lack the resources to fight back.[28] A large portion of small companies have reported significant operational impacts to their businesses due to these attacks.[29] Thus, it is evident that low-quality software patents

[25] James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 Cornell L. Rev. 387, 389, 422-423 (2014).
[26] *Id*. at 394.
[27] *Id*.
[28] Colleen Chien, *Startups and Patent Trolls*, 17 Stan. Tech. L. Rev. 461, 477 (2014).
[29] *Id*.

asserted by PAEs have been detrimental to many high-tech small businesses and startups. Additionally, many small companies using widely available technology report that fear of the risk of patent litigation limits them from entering the U.S. market.[30] This could impact innovation and the economy if startups are not given the opportunity to grow and flourish so as to bring new ideas and technologies to the U.S. However, challenging patents administratively or through litigation is often times out of reach for startups and small companies due to the associated expenses and time, thus a majority of these companies settle and PAEs continue demanding enforcement and licensing for poor quality software patents that are most likely invalid.[31] Further, most of the burden of direct, accrued costs from PAE patent assertions falls onto small companies and this negatively impacts the profits of innovative-startups.[32] Recent surges in low-quality software patent assertions by PAEs have been attributed to significant socially wasteful expenditure in the billions of dollars every year on top of reduced innovation incentives for both small and large companies.[33]

However, large and even medium companies have a different motive and need for valid software patents than startups. Because large companies have more significant market power and revenue than small businesses they may utilize software patents against competitors, for protection against patent trolls, for settlement purposes if they are sued for infringement, or simply to manage an established patent portfolio that enhances the value of the company.[34] Therefore, these attacks

[30] *Id*. Chein further defines "small companies" as individuals, universities, non-profits, companies with fewer than 500 employees, and "significant operational impact" as "delayed hiring or achievement of another milestone, change in the product, a pivot in business strategy, a shut-down business line or the entire business, and/or lost valuation."
[31] *Id*. at 484.
[32] Bessen, *supra* note 25 at 389, 422-423.
[33] *Id*.
[34] John R. Harris, *The Patent System is Under Assault--Startups, Should You Care? Ten Things About Patents that Startups Need to Consider*, 44 AIPLA Q. J. 27 (2016); *see also* Wayne M. Kennard, *Software Patents as a Weapon: Are You Ready to Rumble?*, 547 PLI/Pat. 1123, 1151 (1999) (discussing how large and medium companies obtain software patents to use for settlement purposes if they are sued for patent infringement).

are not as detrimentally affected by such attacks, however, they do still stifle innovation and cause nuisance claims as well as delays to production for larger companies.

DEFINITENESS ISSUES IN SOFTWARE PATENTS

The existence of low-quality patents in the U.S. patent system could be attributed to multiple different influences from within the system, such as issues with indefinite claims. This section of the paper will discuss how § 112 issues play a role in the existence of low-quality software patents in the U.S. patent system.

I. The USPTO and the section 112 definiteness requirement.

Patent clarity is integral to patent validity, and thus integral to patent quality, and because the definiteness requirement is a rather low standard patent clarity issues intrinsically affect the outcome of patent lawsuits.[35] Due to this lower standard, definiteness could often be a tricky patentability requirement to pick up on for examiners, especially in the realm of software. The USPTO has acknowledged this by attempting to clarify the definiteness requirement for personnel conducting examinations by providing guidances, trainings, and examples.[36]

Recently, there has also been a massive backlog of patent applications at the USPTO which is undoubtedly another reason behind the existence of low-quality patents. While the backlog of applications was reduced from 605,646 in 2014 to 553,221 in 2015, there are still half a million applications cued up in the backlog and half a million more applications coming in annually.[37]

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[35] Ken Port, Lucas Hjelle and Molly Littman, *In Pursuit of Patent Quality (and Reflections on Reification)*, 20 Marq. Intell. Prop. L. Rev. 91, 133 (2016).

[36] *See generally* Examination Guidance and Training Materials, https://www.uspto.gov/patent/laws-and-regulations/examination-policy/examination-guidance-and-training-materials (last visited Oct. 14, 2016); Supplementary Examination Guidelines for Determining Compliance With 35 U.S.C. 112 and for Treatment of Related Issues in Patent Applications, 76 Fed. Reg. 7162 (Feb. 9, 2011) (providing examples of § 112 compliance issues that occur during examination, especially focusing on computer-implemented technology claims).

[37] U.S. Patent & Trademark Office, Performance and Accountability Report FY 2015, http://www.uspto.gov/sites/default/files/documents/USPTOFY15PAR.pdf; *see also* U.S. Gov't Accountability

This contributes to the pressure felt by the USPTO, which then turns around and allots very short time periods for examiners to get through large numbers of applications per technology center.[38] The majority of examiners feel they are not given enough time to conduct thorough examinations,[39] and with little time to do their work they will inevitably need to decide to focus on other patentability issues, such as § 102 and § 103 prior art rejections, rather than ensuring the clarity of the application under § 112. Therefore, if examiners are not properly examining applications then the result could be more issuances of low-quality patents and further spikes in infringement litigation.[40]

II. The effect of definiteness issues caused by applicants and practitioners.

When applicants submit flawed or poorly written patent applications it can make the examiner's job more difficult and thus result in delays, or even grants of low-quality patents. For instance, examiners have difficulty with applications translated from foreign languages as well as with the lack of standard terminology used, especially in software applications.[41] Therefore, poor translations and claims lacking clarity which include a myriad of different terms describing the same concept make it much more difficult for examiners to understand claim scopes and conduct thorough prior art searches.[42] If applicants would conduct smart prosecution upfront and be more thorough so as to submit applications that meet § 112 requirements initially, as well as provide comprehensible and accurate translations, then it would lessen the work required of examiners

Off., GAO-16-479, Patent Office Should Strengthen Search Capabilities and Better Monitor Examiners` Work 1 (2016).

[38] GAO-16-479, *supra* note 37 at 21.

[39] Ryan Davis, *GAO Says Time Pressure At USPTO Leading To Poor Patents*, Law 360 (July 20, 2016, 7:37 PM), http://www.law360.com/articles/819570/gao-says-time-pressure-at-uspto-leading-to-poor-patents.

[40] *Id*.

[41] GAO-16-479, *supra* note 37 at 18-19.

[42] *Id*.

during examination so that they may meet USPTO allotted time pressures more easily and in theory only grant high-quality patents.

CURRENT INITIATIVES TO ENHANCE PATENT QUALITY

The paramount supporters in the U.S. for patent quality are surely the USPTO and federal and state governments. As was briefly discussed before, the USPTO has recently launched new initiatives in an effort to improve patent quality metrics and examination practices within the Office. Moreover, Congress, in addition to many state legislatures, has recently implemented legislative measures to diminish the role of PAEs in the courts.[43] Based on recent data trends, patent trolls are more likely to obtain invalid or poor quality software patents and thus pursue abusive litigation to enforce said patents. These poor quality software patents issued to patent trolls will have a direct negative impact on patent litigation and the judicial system.

Furthermore, in light of recent Supreme Court cases that address software patent challenges, it does not seem as though the Court aspires to eliminate software patents altogether. Rather, there appears to be an aim to curb such patent troll litigation. Thus, in order to lessen these types of lawsuits the USPTO must avoid, as much as practicable, the granting of low-quality patents that could be easily invalidated. Below is an analysis of the initiatives that have been undertaken by the USPTO and federal and state legislatures to address these issues.

I. USPTO initiatives.

The USPTO has implemented several initiatives to combat the observable abundance of low-quality patents which are granted and subsequently lead to excessive and even unwarranted patent infringement lawsuits. The main strides the USPTO has taken include a Federal Register

[43] Caroline Craig, *Congress to patent trolls: You shall not pass*, InfoWorld (Sept. 18, 2015), http://www.infoworld.com/article/2984696/government/can-congress-stop-the-patent-trolls.html.

request for public input and guidance directed towards enhancing patent quality which later led to the Enhanced Patent Quality Initiative (EPQI). The EPQI encompasses twelve programs that include search and training enhancement and prosecution enhancement programs, thus these programs will most certainly have a positive effect on patent quality because they aim to address the issues presented before a patent is granted.[44] If the USPTO can enhance the review process when examining applications in order to catch more low-quality applications upfront before a patent is granted, then inevitably this will diminish the impact of releasing low-quality patents into the market as well as lessen the amount of needless patent litigation.

The USPTO also released an Interim Guidance in December 2014 which was recently updated in May 2016 with a Supplement. The Interim Guidance is a resource available to USPTO examiners to use when determining subject matter eligibility under 35 U.S.C. § 101 in view of recent Supreme Court decisions, such as *Alice*.[45] The most recent updates intend to better assist examiners with formulating subject matter eligibility rejections, such as by providing examples and guidance on how to use the two-part *Alice* test.[46] While the Interim Guidance is a good aid for both examiners and applicants in understanding subject matter eligibility of software patents, it does not amount to substantive rulemaking and therefore does not have the force and effect of law. Instead, patent applications must still be examined based on the substantive law and test that has arisen out of *Alice,* which arguably loops back around to the same uncertainty and confusion that was presented when *Alice* was first decided. It is arguable then just how much clarity has actually been provided if there is still uncertainty and the USPTO has merely produced suggestions on how to interpret the applications in view of the case without incorporating the force and effect of law.

[44] *See* U.S. Patent & Trademark Office, *Enhanced Patent Quality Initiative*, http://www.uspto.gov/patent/initiatives/enhanced-patent-quality-initiative-0 (last visited Oct. 4, 2016).
[45] *See* 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Red. 618, 618-632 (Dec. 16, 2014).
[46] *Id*.

However, even with these recent efforts the GAO reported in 2016 that the USPTO still did not have clearly articulated agency guidance in regards to a "consistent definition of patent quality," in addition to no developed measurable goals aimed at assessing whether quality was indeed improving.[47] The GAO acknowledged that without these crucial elements the USPTO is putting its examiners in the position of relying on individualized definitions for "patent quality" and that will make it almost impossible to measure if there have been any changes in quality.[48]

II. Federal and state government initiatives.

There have also been federal and state legislative measures taken that aim primarily at limiting PAE litigation, but they also either directly or indirectly touch on the issue of patent quality. For instance, the Obama Administration signed off on the American Invents Act (AIA) in part to address certain problems present with PAE litigation. However, the AIA "focused almost exclusively on the back end of litigation and post-grant challenge procedures" and "completely failed to address issues of patent quality on the front end in patent prosecution."[49] Thus, this presents the opportunity for low-quality patents to surface in the first place, which may then lead to litigation by PAEs relying on invalid software patents.

Many states, in addition to Congress, have passed "Patent Troll" legislation in the last several years. As it stands, twenty-seven states have implemented anti-patent troll legislation despite the long-standing tradition that patent law is a federal issue.[50] This reflects a growing concern in many states over patent troll litigation and bad faith assertions of patent infringement. Based on previously stated rates and trends concerning software patent invalidation and the fact

[47] Ryan Davis, *GAO Says Time Pressure At USPTO Leading To Poor Patents*, Law 360 (July 20, 2016, 7:37 PM), http://www.law360.com/articles/819570/gao-says-time-pressure-at-uspto-leading-to-poor-patents.
[48] *Id.*
[49] John R. Harris, *The Patent System is Under Assault--Startups, Should You Care? Ten Things About Patents that Startups Need to Consider*, 44 AIPLA Q. J. 27 (2016).
[50] Jonathan Griffin, *2015 Patent Trolling Legislation*, National Conference of State Legislatures (June 15, 2016), http://www.ncsl.org/research/financial-services-and-commerce/2015-patent-trolling-legislation.aspx.

that many PAEs primarily use low-quality software patents to bring infringement suits, it is arguable that if PAEs were never granted these patents to begin with a large portion of the patent troll litigation at issue would be eliminated thus relieving some of the burden placed on the courts and on the states to address such cases.[51] Moreover, Congress has recently passed the Innovation Act, in addition to a myriad of other bills. The bill addresses patent litigation reform in various areas, and includes provisions and requirements that aim to deter unmerited suits by raising the stakes for PAEs.[52] Congress' passing of this bill, and introduction of several similar anti-patent troll bills, mirrors the same concern and need felt by the states to implement anti-patent troll laws.

In addition to these bills, Congress has also established certain changes within specific U.S. district courts to address the prevalent issues concerning patent litigation. The House Judiciary Committee in particular echoed the true importance of high-quality patents when it stated that the "strength of U.S. [patent] system relies on granting strong patents, those that are true innovations and not product of legal gamesmanship."[53] Specifically, the judicial system has implemented initiatives in an effort to amend the handling of patent infringement litigation in federal courts.[54] For instance, a direct result has been the 2011 "patent pilot program" that was established in certain district courts in order "to encourage the enhancement of expertise in patent cases among district court judges."[55] However, many experts agree that it is too early in the project to truly understand the impact this will have on patent litigation,[56] but they appear to be advances made in an effort to

[51] *See* Arti K. Rai, *Improving (Software) Patent Quality Through the Administrative Process*, 51 Houston L. Rev, 503, 505 (2013).
[52] Innovation Act, H.R. 3309, 113th Cong. (2013).
[53] Davis, *supra* note 47.
[54] U.S. Gov't Accountability Off., GAO-13-465, Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality 36 (2013).
[55] *Id.*
[56] *Id.*

lessen abusive and expansive patent litigation, such as those cases that are often seen with software patents and PAEs.

ANALYSIS OF PROPOSED MEASURES

I. GAO proposed suggestions and technology industry responses.

The GAO has conducted targeted studies and released multiple reports on the efficiency of the USPTO and the patent examination procedures in place over the last several years, the most recent one being in June 2016. The following are a select few of the GAO recommended actions that the USPTO should take in order to help improve patent quality: develop a consistent definition of "patent quality" and clearly articulate that definition in agency documents and guidance, further develop measurable and quantifiable goals and metrics related to patent quality, analyze the time needed for examiners to perform thorough examination and specially assess the time examiners would need in different technologies, analyze how current performance incentives affect the extent of effort examiners put into thorough examination, ensure examiners have the necessary technical competences needed for a thorough search in the relevant art, consider whether to require applicants to include claim clarity tools (i.e. glossary of terms, indication of functional claim language, or claim charts), develop written guidance on what a thorough prior art search within each technology field would be, and ensure investment in new information technology tools by developing and periodically updating resources and strategies to identifying key sources of prior art in varying technology centers.[57] Many of these suggestions are also offered by industry experts in their responses to the USPTO and will be addressed below. However, it is clear that all of the

[57] U.S. Gov't Accountability Off., GAO-16-479, Patent Office Should Strengthen Search Capabilities and Better Monitor Examiners` Work 59-60 (2016); U.S. Gov't Accountability Off., GAO-16-490, Patent Office Should Define Quality, Reassess Incentives, and Improve Clarity 38-39 (2016).

GAO recommended changes would also enhance software patent quality because they would establish a mechanism within the USPTO that will provide further clear and concrete instruction for examiners on how to best conduct thorough examination, ensure examiners are properly motivated and using the latest tools at their disposal with the intention of producing high-quality work products, and provide applicants and examiners with guidance on how to submit additional material to provide clear applications that discuss complex and abstract concepts for examination such as those relating to software.

In addition to the GAO, various experts in the high-tech industry have submitted ideas and proposals to the USPTO during its 2015 "Request for Comments on Enhancing Patent Quality."[58] Many in the technology sector see patent examiners as "gatekeepers" whose duty it is to issue high-quality patents.[59] Accordingly, industry professionals have offered suggestions for improving the value of examiners' work products as well as changes that could be made to enhance the overall examination process. For example, Cisco Systems and Google suggested improvements to § 112 enforcement in order to meet the necessary standards and demands for quality associated with the software industry.[60] In the software field, § 112 requirements such as enablement and written description have been inadequately and loosely enforced, and thus the claim boundaries in these types of patents are unclear and do not provide the public with notice in terms of what is or is not protected.[61] Cisco and Google's solution to this dilemma is for the USPTO to require applicants "to identify all key claim terms and provide definitions for those terms by pointing or linking to

[58] *See* Request for Comments on Enhancing Patent Quality, 80 Fed. Reg. 6475 (Feb. 5, 2015) (USPTO notice seeking public input and guidance to direct its efforts towards enhancing patent quality.).
[59] *See* Laura Sheridan, Patent Counsel, Cisco Systems, Inc. and Google, Request for Comments on Enhancing Patent Quality, Docket No. PTO-P-2014-0043 (May 6, 2015); Charles Duan, Patent Reform Project Director, Electronic Frontier Foundation, Engine Advocacy, and Public Knowledge, Request for Comments on Enhancing Patent Quality, Docket No. PTO-P-2014-0043 (May 6, 2015).
[60] *Id.*
[61] *Id.*

the specification, providing a glossary, or relying on an identified dictionary."[62] This would certainly expedite the examination process because examiners would not need guess work to understand claim language and terms in order to develop suitable search terminology so as to identify relevant prior art.[63]

Along the same lines as implementing more strict § 112 enforcement, Oracle has suggested that the USPTO could expand on its policy of customarily denying applications with extremely short independent claims and specifications.[64] Oracle proposed that any claims falling below the threshold of 300 characters, or alternatively below four lines of text, should be flagged for further review by examiners and their supervisors to prevent issuance of claims that are overly broad in view of the prior art.[65] Moreover, exceedingly short specifications, such as those equal to or less than three pages, should also be more closely considered since they are more likely to raise written description or enablement rejections.[66] Oracle's reasoning stemmed from a study they conducted which found that applications with particularly short independent claims were more prone to multiple office actions and Requests for Continued Examination (RCEs), and were typically more costly for applicants.[67] Additionally, Oracle recommended investigating inherently ambiguous language that is inconsistent with case law and that does not promote clarity of the prosecution record.[68] Thus, low-quality patents slipping through the cracks may be lessened by employing more rigorous claim requirements under § 112 and more diligent review by examiners of seemingly insufficient claims and specifications.

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[62] *Id.*
[63] *Id.*
[64] *See* Eric Sutton, Senior Patent Counsel, Oracle, Comment on Request for Submission of Topics for USPTO Quality Case Studies, Docket No. PTO-P-2015-0074 (Feb. 12, 2016).
[65] *Id.*
[66] *Id.*
[67] *Id.*
[68] *Id.*

Cisco and Google also suggested a change from the current count system to one that does not "[incentivize] behavior that may result in the issuance of undeserving patents" by "[overemphasizing] meeting number goals and [underemphasizing] meeting quality requirements."[69] As was previously discussed, examiners feel they are not always given the time they may need in order to properly examine an application, which could yield issuances of undeserving software patents. Thus, Cisco and Google recommend that examiners should be given the time that is necessary for thorough examination, and the USPTO should recognize that differing applications will require varying degrees of attention depending on their subject matter and complexity.[70] Moreover, there should be more collaboration between examiners and applicants in order for applicants to clearly convey and examiners to better understand claim terms and boundaries initially. This would eliminate the bureaucratic back and forth formalities of office actions and responses to office actions which eat up time and delay the process overall. Likewise, the Electronic Freedom Foundation (EFF) stated that reduced examination times for examiners will possibly further reduce patent quality.[71] Thus, diligent review of applications cannot be undermined in an effort to reduce patent pendency because the "pressure to meet pendency targets, together with pressure to reduce the application backlog, is leading to cursory review by examiners and the issuance of thousands of invalid patents."[72]

[69] Laura Sheridan, Patent Counsel, Cisco Systems, Inc. and Google, Request for Comments on Enhancing Patent Quality, Docket No. PTO-P-2014-0043 (May 6, 2015). *See also* Charles Duan, Patent Reform Project Director, Electronic Frontier Foundation, Engine Advocacy, and Public Knowledge, Request for Comments on Enhancing Patent Quality, Docket No. PTO-P-2014-0043 (May 6, 2015) (stating "an overly narrow focus on 'customer service' to applicants risks prioritizing prompt issuance over quality").

[70] *See* Sheridan, *supra* note 69.

[71] Daniel Nazer, Staff Attorney, Electronic Freedom Foundation, Comments of the Electronic Freedom Foundation Regarding Patent Pendency, Docket No. PTO-P-2014-0025 (July 1, 2014) (also stating "empirical research [from 2002 to 2012] confirms that examiners perform lower-quality review when pressed for time").

[72] *Id.*

Experts also agree that examiners should have the latest and most efficient tools and software available in order to facilitate more accurate and accelerated examination. For instance, Minesoft submitted four potential tools that the USPTO could implement in order to better equip examiners: a tool that provides on-demand machine translations of text documents searched in their original language, a tool that allows for search customization in order to search specific fields, a tool that uses integrated advanced analytics capable of handling large volumes of publications in order to produce visual data interpretations, and a tool that automatically alerts examiners when there are changes in technological development or legal status with a selected piece of prior art.[73] Similarly, Google has recently launched a prior art search tool within Google Patent Search which pools patent documents as well as non-patent literature from Google Scholar in order to provide a comprehensive and improved third party patent search for examiners and practitioners.[74] Of course a pre-examination search on Google Patents should not replace a full search by an examiner, but these extra types of searches could provide examiners with added focus and better educate them while examining complex software-related claims.

II. Measures applicants and patent practitioners could implement.

Sources of prior art for software-related patent applications tend to be particularly difficult to locate and to search. For instance, open source software is a treasure chest of prior art for such applications. However, there is a massive drawback in that open source code repositories are designed for software developers and not with patent examiners in mind.[75] Therefore, open source software is only usable by examiners if such records of that software are developed into a

[73] Doug van der Zee, Director, Business Development, Minesoft, Comments on Enhancing Patent Quality, Docket No. PTO-P-2014-0043 (Apr. 24, 2015).
[74] Vin Gurrieri, *Google Launches New Patent Prior Art Search Feature*, Law 360 (July 16, 2015), http://www.law360.com/articles/680010/google-launches-new-patent-prior-art-search-feature.
[75] *See* Charles Duan, Patent Reform Project Director, Request for Comments Regarding Prior Art Resources for Use in the Examination of Software-Related Patent Applications, Docket No. PTO-P-2013-0064 (Jan. 6, 2014).

searchable format by the software industry.[76] For this reason, software that is being developed from small developers to large corporations should be pooled in collaborative efforts to form organized, searchable databases that will shorten the length of time required of examiners to search and put the public on notice of what is already known in the art. In addition to open source community efforts at building useful prior art resources, the USPTO should also engage in the partnership to accordingly develop improved databases for prior art searching.[77] For instance, the EFF has advocated for the USPTO to cooperate with developer communities in order to construct a searchable database of software programs as well as receive relevant field training and unique perspectives from industry professionals.[78] Similarly, Mozilla has encouraged the USPTO to adopt "a peer review board of open source software developers, technologists who are embedded within the software community, and who have the most information and awareness of the state of the art."[79] For these reasons it would be beneficial for developer communities to pool open source codes in an effort to educate the public of available open source software and help the USPTO in building searchable prior art resources for software-related applications that would be usable by examiners, applicants, and practitioners.

What is more, applicants and patent practitioners, in addition to examiners, should have the most up-to-date software and analytics tools in order to submit primarily high-quality applications for review. For example, TurboPatent has released a new analytics tools called Patent Quality Report (PQR) which uses natural language processing technology and validation

[76] *See id*.
[77] *See id*.
[78] Duan, *supra* note 69.
[79] Chris Riley, Head of Public Policy, Mozilla, USPTO Request for Comment on Enhancing Patent Quality, Docket No. PTO–P–2014–0043 (May 6, 2015) (stating such individuals would be better suited to direct examiners towards relevant prior art without taking active roles in determining novelty.).

algorithms to detect quality gaps in patent applications.[80] With tools such as PQR, innovation driven corporations boasting sizeable patent portfolios may reduce patent prosecution time and expenses, create stronger patents with higher quality, decrease patent litigation risks, and accurately evaluate the work product of patent practitioners drafting and prosecuting their patents.[81] Therefore, tools such as PQR allow corporations that fuel technological innovation to work with competent patent practitioners in order to produce novel inventions and high-quality patents that will continue to further promote innovation rather than hinder it. There will be less of a burden on the examination process when patent attorneys develop and produce patents more accurately, efficiently, and consistently because then examiners are given a well-thought out as well as thoroughly searched and written application to examine which effectively reduces the amount of time needed for review.

CONCLUSION

It is evident that the USPTO cannot implement all of the necessary systematic changes solely on its own in order to improve software patent quality; however, the USPTO is in a vital position to be a voice for reform and it could do a great deal administratively within the agency. The USPTO initiatives for enhanced patent quality are commendable, but the GAO and industry experts were accurate in expressing that more can be done to ensure only high-quality software patents are being issued. There is still more the USPTO could do, however, there are also steps that applicants and patent practitioners could take in order to provide clear, well-defined, and appropriately tailored applications that will likely lead to high-quality patents. Until undeserving

[80] *TurboPatent Announces New Patent Quality Analytics Tool*, PR Newswire (April 20, 2016), http://www.prnewswire.com/news-releases/turbopatent-announces-new-patent-quality-analytics-tool-300254360.html.
[81] *Id.*

low-quality software patents are eliminated and replaced with clearly written and well-defined patents, there will expectedly be further to be rises in patent infringement law suits concerning software and high-tech patents as well as a continued negative impact on U.S. innovation and the economy.