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Crowdsourcing Prior Art Search for Pre-Issued Patent Applications

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1.0. Introduction

This proposal has been prepared as a follow up to the *Roundtable on the Use of Crowdsourcing and Third Party Preissuance Submissions to Identify Relevant Prior Art* held at the United States Patent and Trademark Office (USPTO) on April 10th, 2014.

The goal of this proposal is to explore obstacles, present solutions, and outline a plan for implementing a crowdsource model for finding prior art, with an ultimate goal of improving the quality of issued patents. To date, crowdsource models have been effectively leveraged by both the peer-to-patent pilot study[1] and by privately-held companies.[2]

Section 2.0 of this proposal outlines the main obstacles for effectively implementing a crowdsource model for finding prior art. Solutions for overcoming these obstacles are also included in this section. Section 3.0 of this proposal covers some of the lessons learned by Patexia through our crowdsourcing platform since 2010. In Section 4.0 we propose a plan for implementing such a crowdsource model.

2.0. Obstacles

A crowdsourcing plan for the USPTO will need to overcome the following short and long term obstacles to be considered successful:

- Volume
- Cost

The aforementioned obstacles, and their proposed solutions are expanded upon in greater detail in the following subsections:

2.1. Volume

The USPTO receives more than 400,000 new patent applications per year. Given this level of volume, the question must be, "Is crowdsourcing the right fit for all of them?" The USPTO examiners have been successful at their job of examining inventions. However, the *Pareto Principle* (i.e., 80-20 rule) presumes that 20% of that volume of patent applications may be consuming 80% of an examiner's valuable time. Crowdsourcing can have the most impact on the challenging applications by providing a secondary means for obtaining useful and targeted prior art. Within this 20% pool, we suggest starting small. Similar to the Minimum Viable Product (MVP)[3] approach used in software

[1] Peer-to-patent is an initiative started by USPTO to open the patent examination process to public.
[2] Patexia Inc. and Article One Partners are two major players in crowdsourcing prior art.
[3] Minimum Viable Product (MVP) has a strong following for the flexibility it provides to growing ventures to adapt to changing circumstances to deliver the best possible result. The Lean Startup (http://theleanstartup.com/principles) expouses on these values.

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product development, our crowdsource model will expand and evolve as we learn over the course of different pilot studies.

The following conditions can be used to target applications within this 20% pool:

- Apply the Crowd to the Cutting Edge of Technology
  New subject matter areas can be great sources of innovation as inventors can develop breakthroughs more rapidly than in mature subject matter areas. Crowdsourcing allows the examiner to have the crowd's intelligence with them to understand the nuance of a new technology as it is happening.
- Focus the Crowd to the Litigious Subject Matter Areas
  Some subject matter areas are more litigious than others. While this may be driven by broader trends or the players of a particular market segment, it may also be an indication that patent applications in those areas require a higher degree of scrutiny.
- Put the Crowd at the Examiner's Request:
  In some cases, an examiner may believe that further examination is required, but does not have the necessary resources to give it their full attention. For example this could include subject matter areas where substantial innovation is happening in non-English speaking countries, such as Germany, Japan, or South Korea.

Filtering the applications using these conditions can help ensure that crowdsourcing is utilized in the cases where it will have the most impact for the USPTO.

2.2. Cost

Similar to many other industries, an economy of scale would reduce the costs of crowdsourcing over time. In the short term and at a lower volume, there are two ways to address the cost.

2.2.1. Applicant Pays

While this may sound attractive from the USPTO's perspective and there may be applicants who have the necessary budget and interest, the long term success of such a program may not be achievable as most applicants (large and small) may not see the immediate return on their investment to justify paying extra for a crowdsourced examination. In addition, applicants always have access to private crowdsource service providers and can utilize them if desired.

2.2.2. USPTO Pays

As discussed in Section 2.1, for the time being, the subject matter areas can be limited to include only those considered to be most problematic. This will allow the USPTO to examine the model more thoroughly and effectively, and at the same time not impose any new charges or drastic changes to the application process, either internally or externally for the USPTO's clients.

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3.0. Lessons Learned

Since its inception in 2010, Patexia has experienced many challenges in the crowdsourcing and community building space. We are happy to explain how we overcame these challenges and to share the solutions that have worked best for us.

3.1. Expert Network

A valuable network is made up of experts with scientific and technical backgrounds who are willing to contribute either part-time (weekend / evening) or full time to one or more crowdsourced studies.

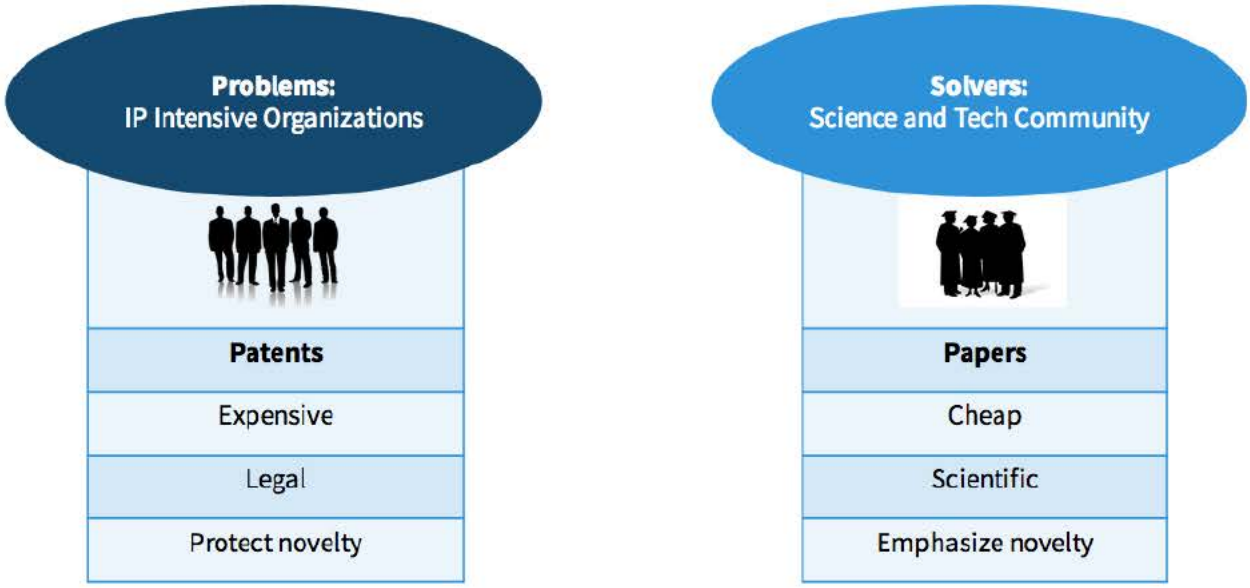

Figure 1. Problem solvers and those with problems often come from different groups

These experts are commonly found among:

- University professors
- Graduate (and senior level undergraduate) students
- Retired engineers
- Ex-patent examiners
- Patent attorneys
- Prior art researchers
- ...

This network can help find the right prior art, however, its constituents may not be familiar with the legal language used in patents. As illustrated in Figure 1, the problem often comes from a group that

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speaks a different language than those who can solve the problem. In academia, journal and conference papers are the main tools to explain new and innovative ideas. The goal of a scientific paper is to emphasize novelty whereas patents are used to protect the novelty with claims and legal language. A solution for this problem will be discussed in Subsection 3.2.

To build and maintain this network, one has to build relationships with organizations that train or work with these scientific and technical experts (e.g. universities, research institutes, ...). Once created, it has to constantly be nurtured, moderated, and trained to attain the highest quality results. Ultimately, the right benefits and incentives have to be communicated within the network. Such a benefit model can include financial incentives, recognition, learning programs, and effective training, among other things.

3.2. Platform

As shown in Figure 2, a successful platform needs to act as a bridge in order to connect the problem with the right problem solvers. By translating the claim language of a patent into technical descriptions and questions that can be easily understood by the scientific community, the platform can enable the users to better understand the problem.

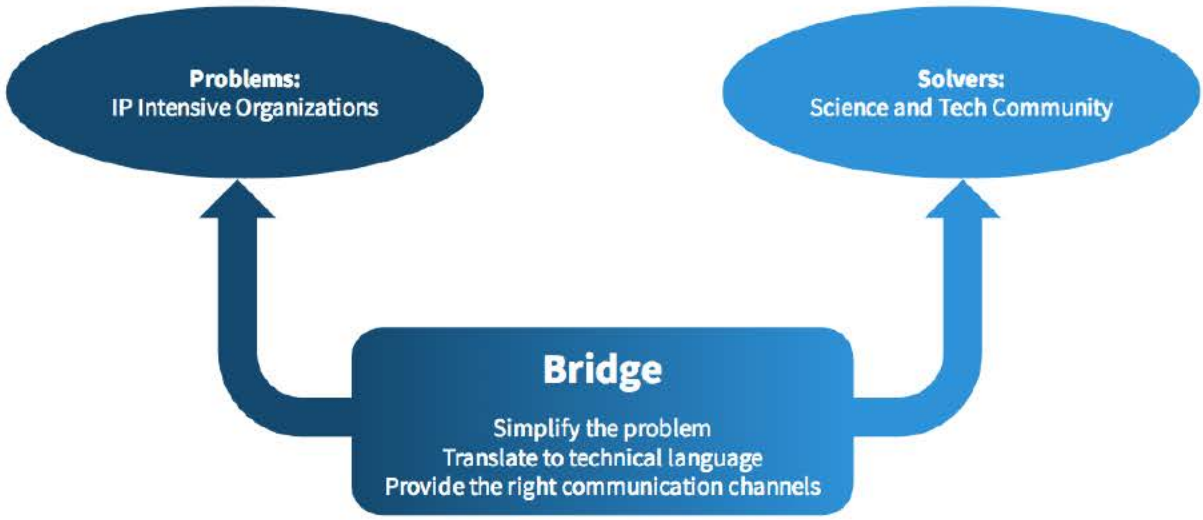

Figure 2. Problems and problem solvers must be connected by a bridge

As an expert network is gathered for the purpose of helping with prior art search, it will eventually form a community. When that point is reached, the infrastructure must exist to provide the right tools and incentives for them to stay around and enjoy their presence. Some of the main factors contributing to an effective crowdsource platform include:

- Clear Purpose
  The community has to see and understand the need for their presence.

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- Transparency and Feedback
  Community members must be able to compete in a fair environment and they must be informed of the rules and their performance.
- Fun and Competitive
  The platform should create a lively environment and make it enjoyable and fun.
- Accessible and Available
  A successful platform has a wide reach and is easily accessible by the right experts from around the globe.
- Right Educational Programs
  While many experts have the ability to help, they may not be familiar with the type of problem. The platform should be able to train qualified experts to the level that they can utilize their knowledge and contribute effectively.

Similar to other communities, to build a successful platform, one has to constantly interact with the community members, get feedback, and learn about and address issues.

3.3. Infrastructure

The internet and technology has made it possible to create a robust cyber community. If we can create the right infrastructure to engage the right people (Subsection 3.1) and offer the right incentive and platform (Section 3.2) online, then we can build this cyber community. The infrastructure has to provide the right user experience and user interface to make it easy for the community to submit prior art.

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4.0. Proposed Plan

The USPTO can engage the private sector to review and test different approaches for crowdsourcing prior art search. This will limit the unnecessary initial investment in building infrastructure, developing a platform, and preparing marketing tools to recruit and maintain a community of technical experts.

We have divided the plan into two parts: Subsection 4.1 reviews the role and required preparation of the USPTO for implementing crowdsourcing, while Subsection 4.2 reviews the role and responsibilities of the private sector in order to effectively work with the USPTO.

4.1. Preparation for the USPTO

As discussed in Section 2.0, we believe that the most efficient way to start this process is to initiate a small program within a few technology centers where the examiners can leverage the third party crowdsourcing platform as a secondary tool to find prior art. This can be defined in the context of a 6 to 12 month pilot project where, for example, 500 to 1000 studies will be launched and crowdsourced to certain networks.

For example, if we assume that technology centers 2100 (software) and 2400 (computer network) are two of the centers that may benefit from crowdsourcing, the USPTO can select 100 examiners within each center to participate in the pilot project. Each of these examiners will be given a quota of 5 studies over a 12 month period where they can launch a crowdsource study to fill in the gaps of their examination by leveraging the power of an expert community. As shown in Figure 3, this means that for each of the technology centers, 500 crowdsource studies will be done over the course of a year.

The numbers shown in Figure 3 are only assumptions. However, the benefits of this approach are as follows:

- This study is very focused so while the sample size compared to 400,000+ applications is quite small, the analysis will be more accurate and larger solutions could be extrapolated from the data.
- A small number of examiners being involved results in a more controlled process in the beginning, better training and closer collaboration to obtain useful data points at the end to further evolve the model and improve it for the future.
- Each examiner has a quota of 5 studies per year which is less than 10% of total volume that they process. Assuming that on average 20% of the applications are more challenging and time consuming than the rest, this provides them with enough time to choose appropriate applications every couple of months.

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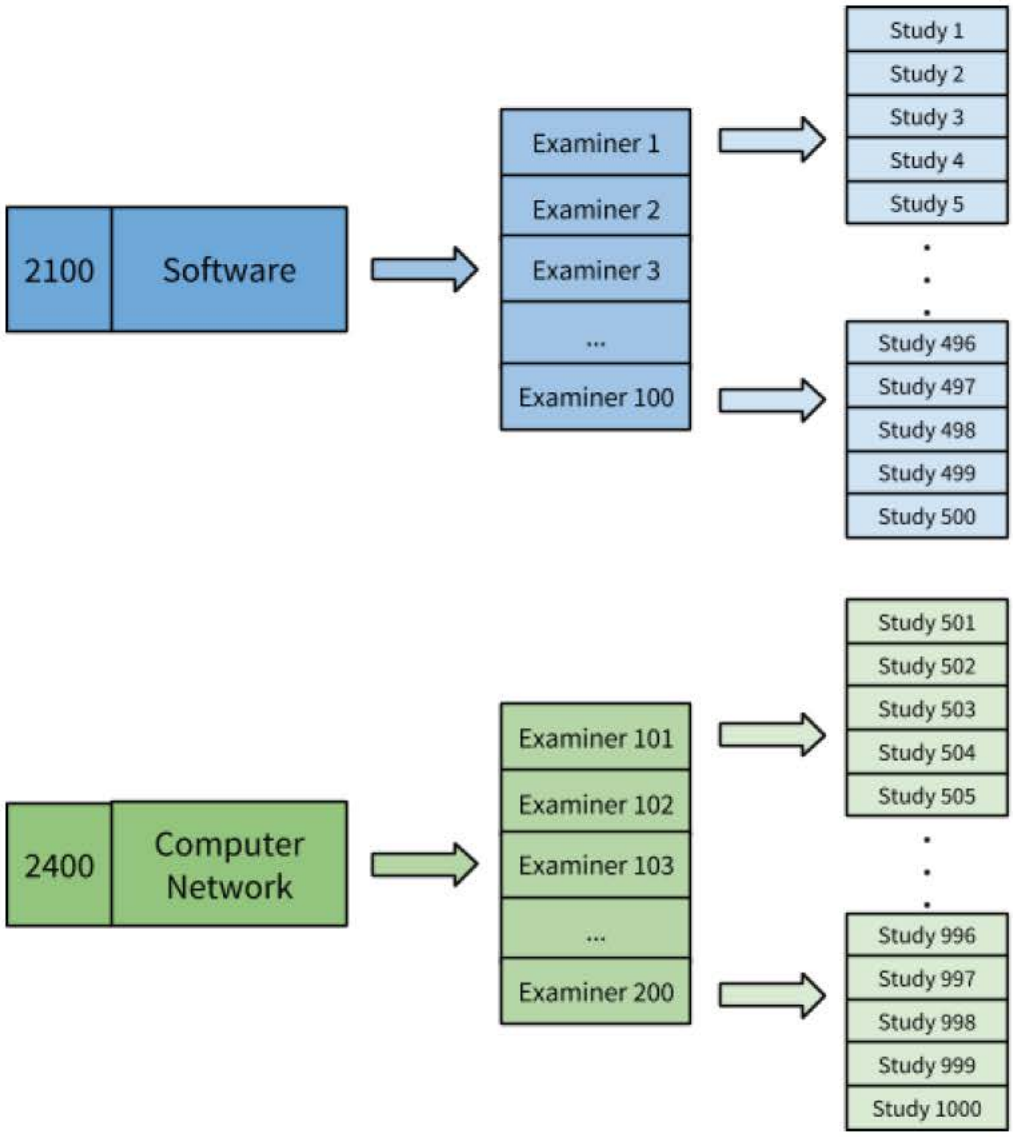

Figure 3. Preparation of the USPTO for implementing crowdsourcing

To avoid the confidentiality issue of newly filed applications, the above studies can be done for only published applications.

4.2. Preparation for the Crowdsource Service Provider

In the above scenario, the examiners will be provided with secure online access to a crowdsource platform with an interface where they can send a request for prior art. The request will include a narrow and well-defined description of what is missing in their search with respect to certain claims and limitations of a published application.

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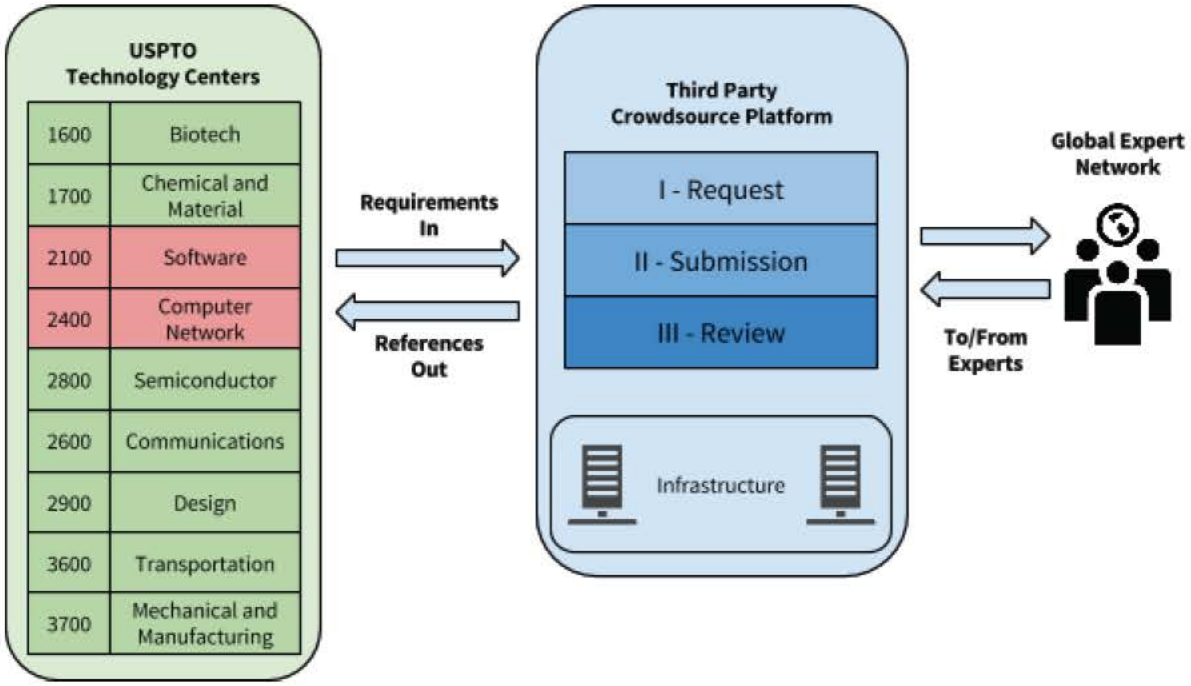

Figure 4. Interaction between the USPTO, third party crowdsource company, and the expert network

The crowdsource study will be completed in the following three phases:

Phase I - Request: Upon receipt of a request by the third party crowdsource service provider, the request is reviewed and converted into a technical study which can be easily understood by the expert community.

Phase II - Submission: Once the study is designed, it will be crowdsourced to an expert community with a set deadline (e.g., 2 to 3 weeks). During this time, the company (and the examiner, if desired) will have access to see the crowd's ongoing activity and, if necessary, to guide them in the right direction.

Phase III - Review: Upon completion of the submission phase, either the third party service provider or the examiner, will be responsible for the review and final assessment of the submissions. The platform can work in such a way that the examiner has direct access to the submission database or alternatively, the examiner only gets the best submissions and final assessment provided by the third party service provider. This latter solution will help reduce the workload for the examiner.

The diagram of Figure 4 shows the interaction between the USPTO and the crowdsource platform. Since the studies are focused on only a few subject matter areas, the expert network and marketing efforts can be more targeted which will result in higher quality community and prior art.

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4.0. Concluding Remarks

Credible sources of information strengthen patent quality[4] and subject matter experts (SME) are the best source of credible information for technical subject matters. Therefore, crowdsourcing to SMEs increases instances of credible information.

Crowdsourcing is a new model and like any other innovative product, it will continue to evolve over time. Application complexity varies and not every patent application requires the same level of resources for examination. Therefore, we suggest that rather than looking at the size of the problem and trying to find a crowdsourcing method that fits all cases, we focus the attention of the crowd on the areas in need of improved patent quality.

As patent quality increases, parties involved in litigation will find it more beneficial to negotiate rather than litigate, which will eventually result in:

- Fewer instances of litigation
- Reduced load for the court system
- Availability of more resources to corporate America for innovation

At the end, we would like to emphasize that like any other successful program, an effective crowdsource program will require focus, a dedicated team, and resources.

About Patexia

Patexia Inc. is a privately held company founded by Pedram Sameni in 2010 and located in Santa Monica, California. Patexia was founded on a simple idea: use the power of information, collaboration, and technology to improve IP research. The essence of Patexia's model is to create an active technical community and to develop the right platform and tools to bring more transparency and efficiency to the world of IP.

[4] A recent working paper authored by Prithwiraj Choundhury and Tarun Khanna investigated the use of "Traditional Knowledge Depository Library" (TKDL) as a prior art resource for USPTO examiners and found that examiner access to better prior art results in an increase in higher quality patents and an observable decrease in patent litigation. Paper is entitled *"Codifying Prior Art and Patenting: Natural Experiment of Herbal Patent Prior Art Adoption at the EPO and USPTO"* and available from the Harvard Business School (link.patexia.com/codifying-prior-art). Author's comments on the impact of the TKDL can be found in *"Bio-Piracy: When Western Firms Usurp Eastern Medicine"* article on Forbes (link.patexia.com/bio-piracy).