

Failsafe Tips for Identifying and Developing Potentially Valuable Patents

By: Terry Ludlow, CEO, Chipworks, tludlow@chipworks.com

In small patent portfolios, it is easy to find the most valuable and useful patents, however with portfolios including hundreds or thousands of patents, the task becomes challenging at best. Yet identifying and developing potentially valuable patents is critical for any business, and especially for technology companies that typically hold significant portfolios. This process begins with understanding exists in your patent portfolio.

The techniques purported to aide in the process of portfolio development continue to evolve, making it more confusing and challenging to find and understand the best approach. Added to this is the subjective nature of determining patent value. It is important to understand that a patent only has value in the context of its place in a portfolio and in how the portfolio is used to support the organization's business strategy. Patent Assertion Entities or Non-Practicing Entities (NPEs), focused solely on licensing patents, will evaluate patent value based on the potential revenue that will come from a licensing program. On the other hand, an operating company may place a much higher value on patents that protect their sole-sourced products' revenue stream or secure their ability to dominate a profitable market.

Traditionally, the best way to evaluate a patent's value has been to rely on legal, technical, subject matter, and market experts. These individuals are skilled at making assessments based on the key factors impacting value. Yet using experts alone may be cost-prohibitive given the size and scope of many portfolios. The tips presented here are designed to offer guidance to companies making use of their patents, i.e. actively purchasing, selling, brokering, or licensing patents. Companies with a sizeable portfolio that have not been thoroughly assessed and that remain uncategorized can benefit disproportionately.

First, don't rely on standard patent valuation techniques. These techniques – cost, citation, market, and income based – are mostly irrelevant to IP and licensing professionals and have no bearing on the true value of patents from a strategic business perspective. They are typically useful only for accounting purposes.

- **Cost Based:** Your cost to develop a specific patent application and the cost of getting a patent issued has no relevance to prospective buyers or licensees, and it is rarely an accurate measure of the ultimate value. "Cost-based" valuation is meaningless to everyone except accountants.
- **Citation Based:** Valuable patents do tend to have more forward citations. While some claim that the number of forward citations for a specific patent can indicate its relevance and ultimately value, the inherent problems with this approach provide an over-simplified and often incomplete or inaccurate measure of value. Citation-based techniques are "in fashion" as software vendors are promoting them heavily in an effort to sell tools designed to track forward citations.
- **Market based:** What was a similar patent worth? Market-based valuations use publically available patent transaction information to provide an indication of value based on the value of other similar patents. This approach requires an active market for the patents used in the comparison, which is almost never the case. Patents are typically sold in larger portfolios with no price breakdowns, patent transaction prices are often kept

confidential, and finding truly comparable patents is difficult at best, making market-based valuations nearly impossible to complete.

- **Income Based:** Income-based valuations or “estimated forward cash flow” valuations attempt to discern the present value of future income anticipated to be generated by patent assets. This approach relies on historical and forecasted financial results, an analysis of the competitive landscape, and an examination of market and industry trends. It is extremely difficult to accurately determine patent value in this manner, and it often comes down to a well-educated guess. Despite these challenges, it is usually the preferred and most accurate method for licensing professionals.

There are three primary factors influencing patent value: legal or quality, technical, and market. Gaining an understanding of these factors is essential. Legal factors revolve around the way claims were written, their ability to stand up to scrutiny under current legal systems, and whether or not they were truly new or could be subject to prior use assertions. Technical factors consider the usefulness of a patent’s claimed invention, including its unique ability to practically solve a problem or be used in particular product/product type. Included in this assessment is whether or not the claims accurately reflect the invention. The factor often most difficult to assess as it can change over time is the influence of the market. While today use may be limited, in time it could become pervasive and ultimately a de facto standard. Market factors are directly correlated to the breadth of use of the invention in products and by the market, its competitive position, the revenue it generates, and whether or not it is part of an industry standard.

Evidence of Use

IP licensing and transaction negotiations often fail outright without compelling evidence of use in the form of accurate and detailed claim charts, which offer concrete evidence that a patented invention is being used in a product and that show how the claims are being interpreted. In some cases, detailed product documentation is available and producing claim charts can be an inexpensive endeavor. However, as companies realize that published documentation can be used against them, this caliber of documentation is becoming nonexistent. As a result, most claim charts must be produced using a combination of sophisticated instruments, complex analytical techniques, and highly skilled subject matter experts (SMEs).

The simplest, most cost-effective way to find evidence of use is by examining the manufacturer’s own documentation, including manuals, product specifications and marketing materials, however this can be limiting if it is the only evidence considered. If a product conforms to industry standards, a review of the standards may be useful. SME and inventor-authored technical papers and other disclosures including patents can provide further indicators. Published evidence is usually limited in scope and often doesn’t include all of the key claim elements needed to definitively prove infringement. Relying on published evidence makes it easy for a potential licensee to assert that they are not using the patent, the evidence details a technology they researched but never used, or “the marketing guys got it wrong.”

Product analysis on the other hand, produces the most effective evidence of use. In order to complete product analysis you must purchase the infringing product from the open market, take it apart and analyze the technical features that correspond to your patent claims. Functional testing can often prove patent claims on operating modes and software algorithms (software can also be analyzed by extracting embedded software and decompiling the code). Destructive physical analysis can address claims covering structures, materials and manufacturing processes. Claims tied to a physical embodiment of software controlling

hardware that is “significantly more” than an abstract idea are most likely valid (even post *Alice vs. CLS Bank*), therefore examining and analyzing the physical embodiments is a very effective way to generate solid evidence of use.

Throughout this process, it is important that technical and legal experts work closely to ensure that claim interpretation is consistent with both technical and legal practices. Legal staff must take care of “file wrapper issues” and ensure legal precedents are accommodated in the claim interpretation, while technical staff must be certain that the technology works, and is manufactured, or operates in the way the claims require.

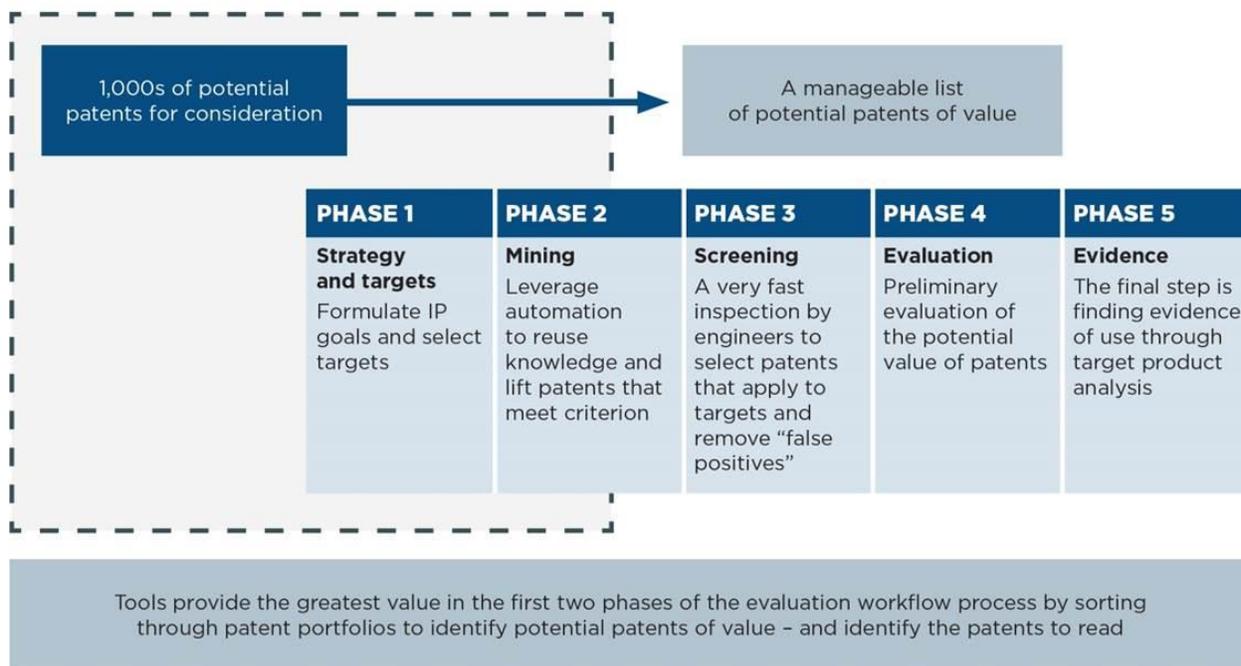


Figure 1: The Five Step Patent Evaluation Process

A Failsafe Method of Finding Potentially Valuable Patents

1. Identify Targets

Licensing managers, depending on their strategic objectives, use different criteria to carefully select their targets. Patent brokers and NPEs need to be certain that a patent (or more likely a portfolio of patents) can support a revenue-generating licensing program. In choosing a target(s) they consider who is using the patented technology, and whether the technology generates profits, reduces costs, and differentiates their potential licensee’s products. They research how much revenue the products generate and how much the patented technology contributes to that profit generation.

If a licensing program can generate more income than it will cost, an NPE may be interested. Corporations may be more interested in evaluating the potential for cross-licensing deals that provide access to new technology, which in turn may generate new products and revenue for both parties. They seek strategic information on competitive advantages, and revenue and profit margin protection.

In all cases, focusing on specific targets with clear licensing objectives will better target the patent mining process and limit evaluation costs.

2. Complete Patent Mining

Using SMEs to read and analyze every patent and its' claims, and then map the claims against known examples of products using the technology, is the ideal way to assess value. Unfortunately, it is usually cost-prohibitive. Patent mining using automated software tools, completed prior to a hands-on screening and evaluation by SMEs, ensures that only patents that have a high probability of value to the current program are read. The best approach to patent mining is to use a combination of tools and techniques to assess a variety of data sources. This helps identify the patents most likely to read on the target(s). The output is a list of prioritized patents organized by technologies and matched to the expertise of your SMEs.

Patent mining is most effective with concrete target(s) in mind. In some cases, the technologies used in the target products can be ascertained from published information, like data books or manuals. More often, it is necessary to complete some preliminary research and product reverse engineering (RE) to secure the facts needed to further focus patent mining. The RE ranges from product teardowns to semiconductor cross sections.

Patent mining should use a combination of keyword, classification code and semantic language search as well as machine learning. Keyword searches require a good dictionary that accounts for synonyms, hypernyms and hyponyms. Classification code searches generally are useful only in the first phases of mining as critical flaws equate to poor precision (relevance of patents kept) and recall (relevant patents missed). Semantic language searches enable a more-like-this search paradigm, which lessens the need for controlled technical dictionaries. Finally, machine learning trains algorithms to find patents in a portfolio based on example patents that represent the technology concept.

Patent topographic maps automatically render text-based technology clusters, which are used to find patents on technologies more likely to be used in target products and identify white space or gaps in a portfolio. Good mapping tools provide flexible color overlays and include machine learning algorithms and Boolean search to turn patents (dots) on / off. The most valuable topographic map strikes an optimal balance between detail and trend analysis, and conveys strategic information to all IP stakeholders. These tools should overlay lists of 'proud' or 'star' patents, competitor's patents, date ranges, IPCs, existing hits or any other patent metadata, on a portfolio map to yield insights.

Keep in mind that mining is inherently lossy and that outliers can be missed. As such, don't automatically abandon patents that were not identified for further study. It's likely that some patents were missed because they didn't address the defined need of the current search, or they were mistakenly rejected by the tools.

3. Screen

In this step, SMEs conduct a relatively quick review of the patents that the software tools produced in order to refine the list of relevant patents. This screening helps eliminate patents that may have been selected but that don't support the objectives and won't read on the target (false positives).

This is also where patents that were inadvertently filtered out but that have potential value can be included (false negatives). Recovering false negatives requires further iterative mining steps with different parameters. This step is especially important if the first analysis failed to generate

the desired number of potentially infringed patents. Either the mining process needs to be repeated or you just don't have enough potentially valuable patents in your portfolio.

At this juncture, patents are usually divided by subject and by some elementary measure of value, e.g. high/medium/low rankings. This process is often assisted by text mining, which allows you to direct smaller piles of patents to the correct SME for detailed evaluation.

4. Evaluate

During the evaluation process, the SMEs read and analyze the claims. Most often, due to budget constraints, the patent disclosure is referred to only when the reviewer is confused about the meaning of claim terms or needs to understand a potential interpretation. A multi-part rating system can be applied to rate the probability of use in industry, the ease of proof of the claims, and sometimes the perceived risk of prior art/prior use being found. Prior use/prior art is often ignored during portfolio reviews because of perceived legal risks if a reviewed patent subsequently becomes part of a litigation in an American court. Ignoring prior art and prior use during rating wastes effort and compromises efficiency for no reason other than mollifying skittish lawyers. Identifying patents at risk allows analysts the opportunity to either eliminate a patent with prior art exposure or understand the claim limitations better and improve the quality and enforceability of claims.

A high priority patent is used in the industry and can be documented easily, while a medium priority patent is more expensive and difficult to document. Remember, all of the ratings are opinions based on the reviewers' experience and quickly sourced references.

5. Patent Product Mapping And Evidence Searching

A patent to product matrix is developed that reflects the program objectives and the patent evaluation. The matrix maps high probability patents to products already being manufactured by potential licensing targets. Both the patents and the products can be segmented by a number of criteria including the patent rating and the market or current and forecasted future sales volume and revenue for the product. This information is used to assess potential risk, potential damages and potential royalty fees.

6. Leveraging Patent Assets for Revenue Generation and Growth

The patent product matrix can be used as an important tool to show how effectively a patent portfolio covers a potential licensing partner's product line and product revenue. Using a standard damages model and royalty rates you can calculate the potential and cumulative value of your patents. The first patent covering a specific product and technology is always the most valuable. Subsequent patents that cover the same products and technology diminish in value exponentially as the number of patents in this cluster grows. In the event that a large cluster of patents creates 'Surplus' patents, they can potentially have value when used in different ways, for example if they are sold or reassigned for other consideration.

Conclusion

Finding the valuable patents in a large portfolio is critical for IP executives seeking to effectively manage their portfolios, yet it can be a daunting task. By relying on a combination of proven methodologies, advanced tools and the knowledge of SMEs, the task of identifying valuable patents in any portfolio becomes easier. Knowledge of the richness of your portfolio optimizes your licensing opportunities and enables the formation of a more effective patent and IP strategy.

About the Author:

Terry Ludlow, Founder, Chairman and Chief Executive Officer (CEO), is a recognized pioneer in semiconductor reverse engineering, and was among the first to realize its value for Intellectual Property (IP) groups and technology teams. He founded Chipworks in 1992 to offer semiconductor and microelectronics system reverse engineering services to companies seeking to build a competitive advantage, and protect and grow the potential of their intellectual property. As CEO, Mr. Ludlow continues to provide the strategy, vision, and driving force that have earned Chipworks its position as the trusted patent and technology partner to the world's largest and most successful companies. Mr. Ludlow frequently addresses industry conferences including the IP Business Congress (IPBC), Licensing Executives Society, and the Brussels IP Summit. He holds numerous patents for his reverse engineering innovations and regularly authors articles for publications around the world.