IP Portfolio Management: Negotiating the Information Labyrinth

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ABSTRACT

The management of intellectual property is all about managing innovation with the procedures and processes that are required to turn that innovation into valuable patent rights. A truly strategic approach to IP management will span conception to product market release. Integrating IP management into the R&D, advance development, and product development cycles seamlessly provides opportunities to gain and enhance IP protection while offering the potential to reduce risk and lower costs. The following chapter discusses some of the key elements of IP portfolio management and how the combination of the right IP tools, procedural know-how, and organizational attributes and behaviors can contribute to successful implementation.

1. INTRODUCTION

The role and importance of patent professionals in IP (intellectual property) portfolio management (IPM) are increasing significantly within business, academic, and legal entities. Driven by the speed and magnitude of today's technological development, the sheer volume of patent information, and the increasingly competitive, global environment, there is a need to more effectively manage the patent process to enhance efficiency and gain a competitive edge in the marketplace. In many respects, this means deploying tools and processes that have been prevalent in the business world:

- data mining and databases for information gathering and storage
- state-of-the-art software tools and processes for data acquisition and analysis
- program management methodologies
- effective communication across technical, business, and legal teams

Couple these with effective, continuous improvement processes, and you have a recipe for efficient generation and management of intellectual property with predicted outcomes and balanced risk (see Figure 1).

2. IPM: THE WORK PRODUCT

The planning, gathering, and analysis of IP information is vital in any organization engaged in efficient competitive intelligence and strategic decision making. From the perspective of IP-portfolio management, the processes and tools that enable acquisition, analysis, and organization of IP information are usually the same, regardless of whether the final outcome is supporting a tactical or a strategic approach. However, the breadth and scope of a patent search, resultant IP analysis, and delivery of information is often quite different. Information developed to support tactical decision making may be narrower in scope and rely on a well-defined product specification within a

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known competitor landscape. Conversely, generating reliable, accurate IP information to support a strategic decision usually requires, among other things, a much broader scope of patent-information search, multiple analysis methods, and various information-delivery vehicles.

A unique blend of skills is required to manage intellectual property successfully. Portfolio managers, or an IPM team, need broad technical knowledge, business acumen, strong communication skills, and a thorough knowledge of U.S. and foreign patent laws and procedures. State-of-the art patent search and analysis tools are needed to gather and analyze patent data, while robust IP database tools maintain invention records, patent information, patent prosecution files, and associated business, licensing, and financial information.

The type and scope of IP analysis that IPM professionals are called upon to research and deliver varies immensely in complexity. Table 1 defines and describes most of the main defined IP-analysis tasks, along with their scope and complexity.

Commercially available IP databases such as Derwent,[1] STN,[2] Thomson,[3] Delphion,[4] and Micropatent[5] offer comprehensive coverage and are well-suited to both simple queries and complex searches limited by patent class or extended-Boolean-technology keyword strings. Free patent searching is available at the U.S. Patent and Trademark Office (PTO),[6] the European Patent Office (esp@cenet),[7] and other country-specific office databases, but is currently unsuitable for detailed patent searches. Databases such as esp@cenet are useful for rapid screening of IP data that has been generated using commercial databases, providing rapid access to an individual patent publication, or an issued patent, in a convenient, user-friendly interface.[8]

IPM professionals are usually trained to generate complex keyword strings from the initial invention disclosure, a combination of invention disclosure, and provided references, or following a technology scan in the technology area of the invention. Synonyms of key technologies will be determined and a search will be performed using specific combinations of technology keywords, with Boolean logic deployed between main searches or search subsets. Patent classification systems are powerful tools, and intelligent use of patent classification (either alone, or in combination with other keyword searches) is extremely effective for relevant patent retrieval. The major patent classification systems are the International Patent Classification (IPC), European Patent Office Classification, and the U.S. Patent Office Classification.

Figure 1: Key Elements of Effective IP Portfolio Management

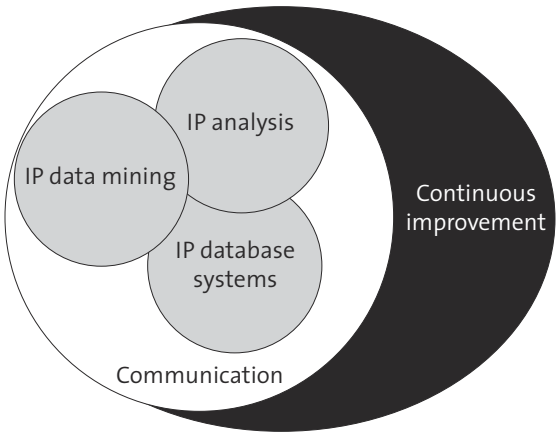


Table 1: IP Portfolio Management Task Definitions

IP Task	Definition, Scope, and Complexity
Technology Scan	High-level scan of the patent and nonpatent literature to gauge current technology status. Used prior to invention conception or may facilitate technology brainstorming
Current Awareness/IP Surveillance	Monitoring of newly published patent applications or issue patents; supports "patent intelligence"/"competitive intelligence" initiatives
Licensing/Business Development IP Support	Patent portfolio maintenance, patent-prosecution support, updating patent status information, generating reports on IP status
Patent Development/ Patentability	Targeted IP search and analysis to determine similar, overlapping, or identical technology. A search is conducted within the full specification of U.S. and foreign patent applications and issued patents
Patent Landscape	Analysis of IP in one or more specific areas of technology; integration of detailed IP analysis information into defined format such as a "landscape" enabling both high-level overviews or detailed analysis (may support patentability or claims analysis activities)
Infringement	Targeted IP claims analysis to determine if one or more patents may be infringed by a new product release to market
Validity	A search for a prior-art reference that may render a target patent or patents invalid

A brief scan of the patent and nonpatent literature is usually performed to provide a quick analysis of a particular technology area. This task may precede or facilitate technology brainstorming, or may be used to aid in and verify invention conception. With the availability and access of free online search tools for literature and patent searching, the task is often performed directly by the scientist or engineer without the need or support of an IPM professional. If the technology concept is in its early stages or is broad in nature, an IPM professional may help to focus the IP search, eliminate irrelevant search data, and help in the analysis and interpretation of the results.

IP surveillance is simply the monitoring of newly published patent applications or issue patents, usually in well-defined technology areas. This activity is usually ongoing with research, advanced development, and product-development activities and supports "patent intelligence"/"competitive intelligence." Currently available commercial patent-search tools allow the generation of sophisticated search terms with automated search frequency and delivery of the results via e-mail. The level of analysis and delivery of that analysis is user-defined. In most circumstances, it is necessary only to provide the patent number, title, and assignee (if known). Individual patent documents can be provided if the number is small, or alternatively, a list with direct hyperlinks to the patent document can be generated. Occasionally it may be necessary to provide a brief summary of the patent document, and/or provide a list of the independent claims. The IPM professional can generate this data, often, by performing a brief scan of the patent specification and claims. IP with complex specifications may require a more-extensive analysis to derive an understanding of the claimed invention. Alternatively, commercial services such as Derwent are available to provide a summary of the invention.

Licensing and business-development support activities including patent portfolio maintenance, patent-prosecution support, patent-status information updates, and generating reports on IP status are key responsibilities of IPM professionals. IP management software systems such as Inteum C/S®[9] are indispensable database management tools capable of integrating patent data (invention disclosure, patent applications, issued patent information, and so forth) with current financials (licensing, fees, patent prosecution, annuity and maintenance fees, and so on). In most circumstances, data will be extracted from the IPM database and an updated patent search performed and cross-referenced to ensure the most accurate patent status? It may also be necessary to access the current prosecution status using the PTO's PAIR[10] or by communicating with the prosecuting attorney to ascertain the most current status.

A patentability, or novelty, search is a search and analysis to uncover technology that may be similar, overlapping, or identical to the intellectual property for which the patent is being sought. A search is conducted within the full specification of U.S. and foreign patent applications and issued patents (in other words, it is not limited to the claims, as a patent or patent publication is potentially prior art for all that is disclosed). In most cases, a patentability search is best conducted by a patent professional. Depending on the nature of the technology and scope of the invention, the volume of search results can quickly become unmanageable. A well-structured search can greatly reduce the search time, eliminate irrelevant search data, and streamline the analysis. It is highly desirable to have completed a patentability search prior to writing claims and generating a patent application. It is often the responsibility of the IPM professional to ensure that this key step is performed, providing analysis of the results relative to the invention disclosure.

A patent "landscape," or "map" is generally an analysis of IP in one or more specific areas of technology. IP search results are analyzed and the information integrated into a defined format such as a visual landscape, or map enabling both high-level overviews or detailed analyses of specific patent documents. The level and complexity of a patent landscape are defined by the question posed. A patent landscape may be useful for providing information on potential areas of research and invention, indicating current position strength, (comparing new disclosures, prefile applications, patent applications in prosecution, and issued patents relative to competitors), or

defining technology "gaps" or "white space." The IPM professional should be cautious when employing a patent landscape/map to define a technology pathway or the potential patentability of an invention, particularly if the data interpretation does not include a detailed analysis of the patent and what information has been disclosed. A technology space may seem to be extremely crowded if defined at a high level with a simple (broad) search strategy, or even somewhat complex (narrow) search strategies. Successive refinement of the landscape using additional subsearches may be required to define 'white space,' and a detailed analysis at the disclosure level for patentability should be performed to assure there are no lost opportunities. In short, it is only when the patent data is analyzed (which usually means reading each patent in the landscape search) that an accurate IP landscape can be generated.

An IPM professional may provide patent search and analysis support for an infringement, for freedom to operate (FTO), or for a validity opinion. An infringement analysis involves a search only at the claims level of a patent and has the purpose of determining whether one or more patents may be infringed by a new product release to market. A validity search is performed for a prior-art reference that may render a target patent or patents invalid. The complexity of a validity search is similar to that of a technology scan or patentability search. A search at the claims level for an infringement/FTO search is simpler, however, the data analysis will be more complex. Here the claims are analyzed in the form of a "claims chart," which allows comparisons from each element of the claim to elements or features of the potentially infringing product. The claim chart is a key tool of attorneys who are litigating patent cases.

3. INTEGRATION WITH INNOVATION MANAGEMENT

Phased-gate innovation management is a process for managing the development of new technology, widely used by mid- to large-size technology companies. The process provides a framework for evaluating a "funnel" of conceptual ideas and early-stage concepts while providing a mechanism for reducing the investment risk. Figure 2 illustrates a phase-gate development process for (A) product development and (B) research and development scenarios. At the end of each stage, numerous input and output factors are analyzed, and the risk, based on the status of the technology, the business impact, market environment, and financial status is analyzed prior to moving to the next gate.

The timely development of a robust patent position, effective patent portfolio management, and continuous monitoring of patent information for competitive analysis and infringement are all important for reducing risk.

Typically, however, IP strategy is applied only at the initial conception stages and at the later stages of product development (after product definition and prior to product release). Patent applications may be filed on early-stage concepts without regard to further modifications or improvements, and monitoring of the competitive IP position. This can leave R&D and business development groups with a false sense of security, believing that the simple act of filing provides solid IP protection.

Embedding the IP management process into the technology-development process is a key strategic approach to new technology development, IP portfolio development, and strategy. By integrating IPM continuously into the phase-gate development process—from conception through R&D—advance development, and product development, an organization may evolve a stronger patent position, optimize R&D costs, reduce patent expenses over the long haul, and minimize the potential for patent infringement and litigation risk. This approach is illustrated in Figure 3, which shows a phase-gate technology development with integrated IP management processes.

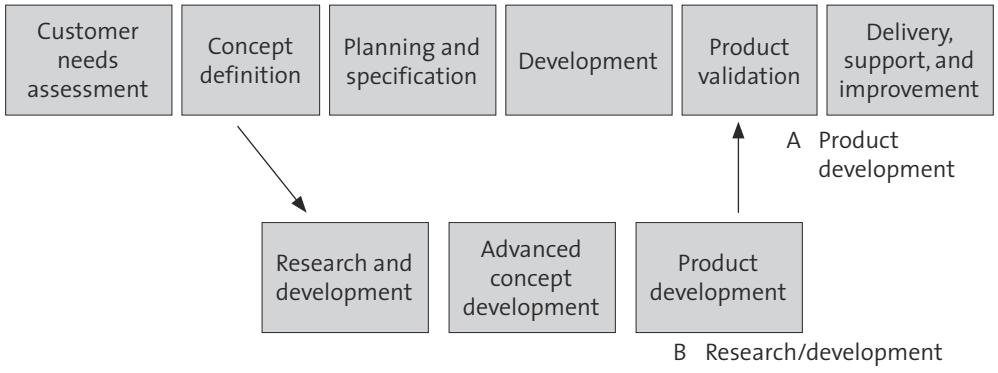
During the initial phase of project definition or concept development, the use of patent landscape or mapping methods may be useful for providing information about potential areas for research and invention, partnering, or licensing opportunities. There may be relevant disclosure in one or more patent applications already in prosecution, patent protection may already exist in a specific technology area of preliminary interest,

or there may be an opportunity to license-in the technology. Discovery of prior applications or issued patents can be advantageous or detrimental depending on the breadth and scope of the invention as disclosed in relation to what may now be perceived to be new and novel. Prior disclosure may not be enabling for the new invention, however, an earlier published application or issued patent may be prior art. Given a analysis of the current IP portfolio, there may be opportunities to amend applications in process, abandon and refile, or file for reissue to gain broader protection. In-licensing may provide an opportunity to gain access to a key technology in the very early stages of product development, providing an opportunity to significantly lower the cost of development and decrease time to market. IP development will be most active during the early-concept and R&D/advanced-development stages, tapering off in the later stages of product development as the product becomes more defined. However, effective IPM processes need to be maintained in these later stages to ensure that patent prosecution is adequately supported. Provisional patent applications filed during the initial stages may at this stage be nonprovisional applications that are one or two years into prosecution, or PCT applications may be reaching the national stage. Continued advanced-development activities or product development may involve generating new inventions requiring patentability analysis and tactical or strategic positioning relative to the growing patent portfolio. Meanwhile, continuous patent monitoring may indicate that the competitor IP landscape is shifting, opening up the possibility of minor or major modifications being needed with respect to the product development strategy.

4. CONCLUSION

Technology development and IP management need to be intertwined to ensure commercial success and company viability. The increased complexity of high-technology research and development, the need to develop global-market strategies, reduction of product-life-cycles, and broadening product portfolios require an integration of IPM practices and procedures into innovation and product development. Organizations can capitalize on the integrated IPM approach by blending state-of-the art IP search and analysis tools and techniques, IP database management systems, continuous improvement processes, and seamless communication between R&D, business, and legal teams. Successful integration of

Figure 2: Integrating the IP Management Process into the Technology-Development Process



this model can enable the transformation of innovation into value, by defining strategic direction and the protection of rights based on a broad, high-quality patent portfolio. ■

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1 www.derwent.com/.
2 www.cas.org/patents/index.html.
3 www.thomson.com/content/scientific/brand_overviews/patent_store.
4 www.delphion.com/.
5 www.micropatent.com/static/index.htm.
6 www.uspto.gov/patft/index.html.
7 ep.espacenet.com/?locale=en_EP.
8 See, also in this *Handbook*, chapter 14.3 by H Thangaraj, RH Potter and A Krattiger.
9 www.inteum.com/inteum.html.
10 See portal.uspto.gov/external/portal/pair.

Figure 3: Technology Development: Embedding IP Intelligence

