Integrated New Product Development:
What’s Law Got to Do with It?
The Role of Legal Counsel in New Product Development

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Introduction

New product development is aptly considered the transformation of market opportunities into commercial products (Krishnan and Ulrich, p. 1). Though this transformation is accomplished differently from company to company, all effective new product development (NPD) processes draw input from various disciplines. And they are optimized when they utilize cross-functional teams including representatives from each key discipline.

But even well-implemented NPD processes will fail if legal review of products is delayed or bypassed. Late legal review can cause teams to miss preannounced launch dates (and the associated embarrassment). Late legal review can also require eleventh-hour design changes. Scrapped mold tooling and wasted development resources are painful to accept after an otherwise-successful NPD process.

An emerging model for integrated NPD formally infuses the legal discipline into NPD processes and ensures that end products not only meet the requirements of traditional members of cross-functional teams but also pass legal muster before they go to market. Legal review of regulatory requirements and liability risks is a must before product launch. In the critical arena of intellectual property (IP) rights, legal counsel guides the NPD team toward products that are truly “ownable” in that they both enjoy exclusive rights and avoid intolerable infringement risks.

Integrated New Product Development

Every NPD process defines a social system in which design and development work is carried out (Krishnan and Ulrich, p. 11). In integrated NPD processes, that social system includes cross-functional teams formed of individuals from various disciplines that collaborate throughout the development process. Though they may include members from a variety of functions including marketing, design/engineering, manufacturing/operations, finance, purchasing, customer support, and quality (Kahn, p. 582), cross-functional teams typically include key representatives from design, engineering and marketing disciplines (Figure 1 below, Cagan and Vogel, p. 138). Designers contribute to the product’s ultimate look and feel by considering ergonomics, product interface, features integration, and material selections. Engineers focus on utilitarian aspects such as functional features, product platform, safety, and reliability, and product cost. Promotional considerations are the domain of marketing managers, who address branding, lifestyle image, and ease of use (Cagan and Vogel, p. 141).
The integration of design, engineering and marketing disciplines in cross-functional teams has become an established NPD practice. Integrated NPD has replaced outmoded “over-the-wall” approaches where engineers threw product designs “over the wall” to designers to add an aesthetic skin or engineers were handed product requirements from marketing whether or not those requirements could be met. About 70 percent of surveyed business units now utilize formal cross-functional NPD processes as compared to only about 10 percent using sequential NPD processes (Boike and Adams-Bigelow, p. 14). Of best performing business units, almost 80 percent of NPD project teams are now cross functional, and such teams are currently embraced by a great majority of businesses (Cooper, pp. 16-17).

The establishment of interdisciplinary NPD in industry is further reflected in academic programs structured to prepare students to succeed in cross-functional design teams. The integrated product development (IPD) program at Lehigh University, perhaps the first of its kind (planned and implemented over 20 years ago), is an exemplary program that draws students and faculty from the College of Arts and Sciences, the College of Business and Economics, and the College of Engineering and Applied Science (Watkins, Ochs, Boothe and Beam, pp. 4 and 8). Lehigh’s IPD program forms cross-functional teams of business, engineering, and design arts students that complete industry-sponsored projects. Similar programs have followed at Western Michigan University (Correa), at the University of Illinois at Chicago (Melamed, Page, and Scott), and at many other universities.

**Integrating the Legal Discipline into Cross-Functional Teams**

An emerging NPD model builds upon traditional processes by formally integrating legal counsel into cross-functional teams and layering legal criteria with those set by design, engineering and marketing disciplines from the start. Products developed by these teams embody the characteristics demanded by all disciplines, including those required by legal counsel (Figure 2), and are market ready.
Legal issues such as regulatory requirements and product liability risks are best considered early in NPD processes to avoid panicked reviews in the eleventh hour. How such legal review is best integrated in NPD processes is driven by the nature of the legal issue, the legal criteria applied, and the junctures at which those criteria must be evaluated.

The need for early legal review within the cross-functional team is especially acute for IP issues. IP rights are optimized when actions (and precautions) are taken early in the design process, thereby preserving valuable competitive advantages otherwise lost. And learning just prior to product launch that a product infringes IP rights of others is inefficient at best and disastrous at worst.

**Infusing the Legal Discipline into NPD Processes**

Whether a new product design is considered incremental (cost reductions or product improvements), platform (next-generation products), or breakthrough (products new to the company or the world), NPD processes are generally structured in sequenced stages preceded by an unstructured “Fuzzy Front End” (Koen, p. 82). The Stage-Gate® process exemplifies a five-stage, five-gate model (Cooper, p. 25). Each NPD process is tailored specifically to the needs and culture of the company using it, but NPD processes generally involve concept generation, feasibility study, product development, and commercialization. A model for integrating IP review into each of these general phases is described in the following paragraphs.

**Concept Generation**

In this phase, product concepts are traditionally generated and selected (or discarded) based on input from the design, engineering, and marketing disciplines. Legal input integrated in this phase not only facilitates concept review but actually fosters ideation.
• **Inspiring Ideation**

A key contribution of IP counsel in the concept phase involves research into prior solutions to the product development challenge. Studying prior efforts catalyzes innovation, prevents “reinvention of the wheel,” and allows the cross-functional team to “stand on the shoulders of giants.” This is in fact a fundamental tenet of our patent system, which follows a constitutional mandate to “promote the progress of science and useful arts.” By encouraging inventors to promptly and thoroughly reveal their innovations (and the best way to use them), our patent system makes innovations available for improvement by others. The result is a massive, comprehensive, and free collection of public patent literature describing past and current innovations.

The patent literature includes patents and published patent applications. Nearly seven million utility patents describe technical innovations, and more than half a million design patents illustrate ornamental product configurations. The patent literature also includes pending utility patent applications published eighteen months after they are filed. This substantial collection of technical information (not to mention patents and applications from around the world) can be synthesized by IP counsel to inspire the NPD team in the concept phase.

With input from other team members, IP counsel develops a thoughtful search strategy to identify patents pertaining to the product development challenge. Such a “state-of-the-art” or “collection” search is guided by a highly specific classification system used by the U.S. Patent and Trademark Office (PTO). The PTO divides patent literature into searchable “classes”--based on technology for utility patents and ornamental features for design patents--that are further divided into smaller “subclasses” (Overview of the Classification System). There are over thirty defined design classes and nearly a thousand utility patent classes. To say that the patent literature is adequately catalogued and searchable is a serious understatement.

Inspiration can also come from within a company’s own patent portfolio. While a state-of-the-art search exposes the NPD team to the efforts of others, a company’s portfolio can provide another starting place when looking into new products or expanding into new business opportunities (Schoppe and Pekar, p. 303). IP counsel is instrumental in “mining” such a portfolio for patents of interest to the team.

Where a prolific inventor or prospective competitor is known, patents of such inventors and competitors are of great interest to the team from the perspective of ideation and risk assessment (discussed below). Searches are also focused by date ranges, references to known patents, and other search criteria set by the NPD team in a collaborative effort.

• **Identification of General IP Risks and Opportunities**

In addition to inspiring ideation, state-of-the-art patent searches reveal general areas of IP-related risk and opportunity. Prospective infringement risks may be found in patents owned by prospective competitors, including potentially blocking patents. Though specific risks will be identified and managed later by IP counsel in the feasibility study and product development phases, this early identification of general risk areas helps the NPD team to navigate IP minefields.

In addition to risk areas, patent searches often reveal fruitful IP-related opportunities. Partners or merger targets may be identified, and the patent literature will help the NPD team to develop strategies for securing IP protection from others (by license, assignment or merger), to explore areas for prospective patent protection, and to find technologies that are already available in the public domain.
When fully integrated into NPD processes, IP counsel fosters concept generation and spots general IP risks and opportunities early on. Collaborative input from design, engineering, marketing, and legal representatives of the cross-functional team thus supports the ideation and filtration functions that ready concepts for feasibility review.

Feasibility Study
Cross-functional teams must consider the feasibility of product concepts generated in the concept phase and traditionally do so from the perspective of the design, engineering, and marketing disciplines. While marketing professionals ask whether it is feasible to promote selected product concepts, engineers and designers consider whether it is feasible to develop the concepts within cost, performance, and aesthetic constraints. IP counsel answers the important question whether product concepts are legally feasible by identifying specific IP risks and pursuing IP protections.

• Identification of Specific IP Risks
It is critical to screen product concepts that would give rise to intolerable risks of infringing IP rights of others early in NPD processes. For example, functional features of product concepts that come dangerously close to exclusive rights claimed in utility patents must be carefully considered. Similarly, an ornamental feature of a product concept may resemble a design claimed in a design patent.

If specific risks are identified, IP counsel will guide the NPD team toward alternative concepts that do not share those risks. If needed, IP counsel facilitates a "design around" in which the NPD team modifies a product concept to reduce an infringement risk. If a relevant published patent application is identified, IP counsel monitors the progress of that application as it is examined by the PTO to anticipate what claims might be granted by the PTO. These efforts are best made in this early NPD phase, well before the development and commercialization phases, to avoid eleventh-hour product revisions.
Securing IP Protections

IP protection is considered in the feasibility phase, and IP counsel leads the team’s efforts to protect selected product concepts. Because the commercial success of many products depends not only on how they function but also on their aesthetic appeal, IP counsel sets strategies to secure comprehensive rights, utilizing all available modes of IP protection. For example, IP counsel can use the exclusive rights afforded by a design patent to help secure the brand identity needed for trade dress protection, recognizing that non-functional elements of a product’s form can enjoy dual protection through design patents and long-lasting trade dress protections (Cohen I and Cohen II, p. 82).

For source-identifying product configurations, packaging designs, and product names, IP counsel takes steps to secure trademark and trade dress rights. Before securing trademark registrations, IP counsel will consider the rights of others and determine whether prospective trademarks are available for adoption and federal registration. Copyright protection is obtained for software innovations and other writings associated with product concepts, and IP counsel implements procedures to secure trade secret protection if product features or processes can be kept secret.

IP protection is sought not only for the preferred concept but also for alternative concepts that may later be preferred by the company or that may present viable alternatives for competitors. By obtaining exclusive rights to all of the best solutions to the product development challenge, commercial advantages over competitors are secured.

IP protection should be sought before concepts are shown to prospective suppliers and customers, another benefit of early IP review. Predating such disclosures preserves foreign and domestic patent rights. If a design concept must be disclosed (for Voice of the Customer (VoC) review or to communicate with vendors), IP counsel prepares Non-Disclosure Agreements for use by the NPD team.

Product Development

IP counsel helped the NPD team to eliminate risky product concepts in the feasibility phase, and a product concept acceptable to all disciplines has now been selected for development. Though the risk assessment conducted thus far by IP counsel identified general risk areas, specific IP risks associated with the selected product concept must now be identified and considered by counsel. Such due diligence is conducted before product launch to respect the IP rights of others.

In contrast to and yet supplementing the state-of-the-art search performed in the concept phase, a targeted search is conducted by IP counsel to identify patents specifically relevant to the selected concept. The search targets unexpired patents and published patent applications that claim exclusive rights to features of the product under consideration. Again, this search is based on the PTO’s classification system, known competitors, and other criteria set by the NPD team.

If patents are identified that pose a risk of infringement, IP counsel helps the team to avoid or modify any particular product features that give rise to that risk. This process of “designing around” identifies design modifications that place the ultimate product outside the scope of the IP rights of others. Such modifications often lead to new innovations and IP opportunities.

The activities of IP counsel in the development phase are best characterized as specific risk management. IP counsel identifies for the cross-functional team specific risks and suggests avenues acceptable to the design, engineering, and marketing disciplines to reduce those risks. Once those risks are managed, the product can be cleared for commercialization.
Commercialization
In the commercialization phase, the now competed product design is readied for launch. IP counsel memorializes the assessments conducted in earlier phases and ensures that IP protections have been pursued.

• Memorializing IP Review
Before commercialization, structured NPD processes require formal legal clearance and confirmation that any risks associated with the launch of the product are tolerable. It is prudent for IP counsel to memorialize the reasons why the product does not infringe any identified patents. This may require the preparation of a formal written opinion with a detailed legal analysis of the patent and its history at the PTO. Documentation of a good faith belief that the product does not infringe IP rights of others will help shield the company from accusations of bad faith and willful infringement.

• Confirming IP Protections
Before launch, IP counsel ensures that IP protections are in place. Foreign protection may be of importance where a product will be sold overseas or if value can be derived from licensing the product innovation to foreign companies. IP counsel will also ensure that steps have been taken to perfect trademark, patent, trade secret, and copyright protections, as appropriate. And upon product launch, IP counsel will establish procedures for monitoring the activities of competitors to police the IP rights that are vital to the commercial advantage they create.

Conclusion
Cross-functional NPD teams are better positioned to transform market opportunities into successful products when the legal discipline is formally integrated into those teams. While regulatory and general liability risks must also be considered, NPD processes benefit greatly from integrated IP review. As a member of the cross-functional team, IP counsel develops strategies to optimize IP protections and secure commercial advantages over competitors. And by conducting early risk assessments, IP counsel reduces the risk of infringing IP rights of others. In this emerging model for NPD, legal counsel (IP or other) facilitates the development of products that not only meet the criteria of the design, engineering, and manufacturing disciplines but that also pass legal muster before they enter the marketplace.
References


