J PROD INNOV MANAG 2010;27:283–290
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FROM EXPERIENCE: Disruptive Innovation and the Need for Disruptive Intellectual Asset Strategy

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Disruption *has become a popular business term, yet it is often used so loosely as to convey almost nothing of substance. Here a largely neglected factor is addressed: the role of intellectual assets in securing opportunities for or averting threats from disruptive innovations. While the literature explains why the decision-making systems in large established companies cause difficulty in responding effectively to disruptive innovation the generation of intellectual assets (e.g., patents, publications, trademarks) typically is not subject to the same cultural and structural barriers. Though it may be difficult to convince a business to invest millions in pursuit of a speculative disruptive innovation, it is much easier for a small team to gain support in pursuing low-cost intellectual assets in the name of mitigating potential threats. A two-pronged approach is proposed that builds on the authors' experience at Kimberly-Clark Corporation in dealing with disruptive threats and opportunities. The approach calls for generation of intellectual assets, often using small proactive teams, to (1) protect an existing business by reducing competitive risks from disruptive innovation, including the risk of new products with disruptive potential and the risk of associated competitive patents that might limit one's response; and (2) prepare for future new and disruptive business opportunities that could be protected or strengthened by the intellectual assets generated. Kimberly-Clark's growing experience with this approach suggests that it may be a valuable component of one's strategy for innovation and protection of the business.*

Introduction

When Kleenex facial tissue was introduced in 1924, the innovative soft paper was marketed to women as a tool for removing cold cream. Early marketing efforts tapped into the mystique of Hollywood and the need of movie stars to remove theatrical makeup. In the following years, Kimberly-Clark Corporation would learn about new benefits of this product directly from the marketplace. Consumers began writing to the company, extolling the use of Kleenex facial tissue as a convenient replacement for the handkerchief in dealing with the common cold. Marketers at Kimberly-Clark responded, repositioning the product in the early 1930s as "the handkerchiefs you can throw away." What began as a product for cosmetic removal would soon grow into one of the world's most famous brands. The rise of this brand would follow classic principles of disruptive innovation.

What is often overlooked in discussions of this brand is the effect it had on handkerchiefs. As Gustafson and Chester (2002, p. 9) explain in their history of the handkerchief, the emergence of Kleenex facial tissue did not immediately upset the handkerchief market, but by the 1950s and '60s they had faded to a much less prominent role than they played when the Kleenex facial tissue brand was born. No longer was the handkerchief an essential part of a man's wardrobe, whereas facial tissue became an indispensable household item. There was little that the handkerchief manufacturers could do about this disposable alternative, for the skills, assets, technology, and supply channels to compete in the disposable tissue market were generally unavailable to handkerchief manufacturers.

Meanwhile, Kimberly-Clark would aggressively pursue intellectual assets (IAs) such as patents, trade secrets, trademarks) to protect its business from those who could or would become competitors in the area of facial tissue. Note that the term *intellectual assets* is broader than *intellectual property* (IP), for, in addition to patents, trademarks, and other items that can be legally owned, it also includes publications and other forms of information that are not owned. Hundreds of patents have been obtained over the years to protect numerous aspects of the tissue-making process such as sheet structure, product properties, equip-

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ment, packaging systems, converting systems, printing technologies, and added benefits such as lotion treatments or antiviral additives. Numerous other issues have remained the subject of closely guarded trade secrets. Intellectual assets have been a critical part of the Kleenex facial tissue brand and of many other disposable products developed by Kimberly-Clark since the rise of Kleenex facial tissue.

Several product lines pursued by Kimberly-Clark have followed similar trajectories, disrupting an established class of products or reaching large numbers of previous nonusers with a convenient alternative that the incumbents tended to ignore, not because they were blind but because the new product had an asymmetric advantage making direct competition with the new product difficult. Cloth diaper makers were unable to respond effectively to disposable diapers; training pants makers could not compete directly with disposable Pull-Ups training pants; cloth towel makers could not match the cost and performance benefits of disposable nonwoven towels; and neither swimsuit manufacturers nor traditional diaper makers had the resources and skills available to directly compete with the Huggies Little Swimmers disposable swimpants product.

However, within all consumer product companies, many innovative new product concepts never make it to market, including some that could have been major successes. For example, in the early 1990s, several consumer product companies explored new product concepts based on disposable mops for household use. Many interesting innovations were proposed. While Kimberly-Clark and others filed several patent applications for some disposable mop concepts, many potentially important innovations were not filed, perhaps because they were viewed as off-strategy as the project fell out of favor and as resources were focused elsewhere. Of course, in the mid 1990s, there was little reason to believe that disposable mop systems would become an important area in the consumer products industry. Typical consumers were not overtly asking for that.

In the late 1990s, Procter & Gamble (P&G) would introduce the Swiffer mop, a product that would become an oft-cited example of *disruptive innovation*. With its low-cost disposable wiping surface, mopping would be transformed to a more convenient and easier activity. While there were prior products with related concepts, such as the 3M Doodleduster device from the early 1980s, the P&G product provided a practical and simple solution suitable for many consumers. It would offer ''worse'' performance relative to the durability and cleaning power of conventional dry and wet mops but would convert many nonmoppers and infrequent moppers into frequent floor cleaners.

Kleenex facial tissue and the Swiffer mop are useful examples of disruptive innovation: an innovation that may be initially worse in terms of standard metrics of established products and customers but that appeals to nonusers or low-end users by offering improved convenience, lower cost, or other benefits not previously viewed as the basis for competition (Christensen, 1997, 2006; Christensen and Raynor, 2003; Christensen, Anthony, and Roth, 2004).

One aspect of disruptive innovation that has not received much attention previously is the role of intellectual assets in dealing with external disruptive threats or, in other cases, in helping to deal with internal barriers to the pursuit of disruption. Consider the case of the Swiffer mop. In *The Design of Things to Come*, Vogel, Cagan, and Boatwright (2005) point to P&G's intellectual property for the Swiffer mop as critical to its commercial success in the face of intense competition. Had the foundational patents for such a mop belonged to another company, the Swiffer mop story might have changed substantially.

The present paper argues that intellectual assets can provide a two-pronged approach for dealing with disruptive innovation. These prongs are defensive and offensive: (1) defending against external competitive threats with low-cost intellectual assets; and (2) using low-cost intellectual assets to lay a foundation for

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future business growth. The integration of defensive strategy with the offensive second prong may provide a way to deal with one of the primary conundrums of disruptive innovation: the inherent tendency of large corporations to ignore or kill disruptive innovation until it is too late.

In dealing with the threats and opportunities of disruptive innovation, a *disruptive intellectual asset strategy* carried out by a fraction of the research and development (R&D) community in a corporation can level the playing field to give large corporations or other incumbents better opportunities in a world of disruptive innovation. The opportunities can be especially great if the corporation is poised to apply open innovation to tap into the disruptive opportunities developed by smaller partners.

Facing the Barriers

With hindsight, it will always appear that myopia is the ultimate killer of disruptive innovations. The condemnation of business myopia has been popular among those who have reviewed innovation and business trends, with a classic and timely condemnation of ''marketing myopia'' coming from Ted Levitt (1960) five decades ago. However, the typical corporate failure to deal with disruptive innovations is not because the managers who make such decisions are inadequate or stupid. A critical lesson is that the fate of disruptive innovations naturally follows from managers making sound decisions in achieving exactly what they have been trained and asked to do.

Long before Clayton Christensen provided a theoretical framework for analysis of disruptive innovations, other thought leaders in business such as W. E. Deming had observed that great corporations repeatedly tend to lose their market positions to new entrants (Tushman and O'Reilly, 1997). This trend, sometimes called the tyranny of success, was discussed, for example, in 1963 by IBM's chief executive officer, Thomas J. Watson, Jr. (Paap and Katz, 2004, p. 14). Henderson (2006) also writes about *competency traps*—the traps that occurs when a company focuses on its strengths such as customer competence obtained with the existing generation of technology but thereby failing to see the opportunity (or threat) that a disruptive innovation presents. However the problem is framed, the issue is one of life and death for a corporation, and serious, strident efforts should be made to avoid the losses that often catch the unprepared.

Christensen and Raynor (2003, pp. 178–83) argue that visionary leaders need to create special units with different systems, cultures, and expectations to have any hope of regularly pursuing disruptive innovations, and even then the odds will be against the effort. They also call for organizational change to overcome the natural mechanisms that kill disruptive innovations. Large corporations, however, are said to face especially difficult barriers in this area (Christensen and Overdorf, 2001).

A Proposed Solution: Disruptive Intellectual Asset Strategy

While organizational change to support disruption is often difficult and costly to bring about, intellectual property and other forms of intellectual assets may be a tool that can allow small groups within a company to aggressively defend it from external disruption and prepare for future commercial exploitation of disruptive innovations. The innovations may be killed for a period of time by normal screening processes, but when such innovations become recognized as important in the marketplace, the corporation with ''disruptive intellectual assets'' may be positioned to thwart the momentum of the disruptive entrant and later take advantage of the opportunity. Without such intellectual property, the disruption of the business may be inevitable. Thus, a corporation with disruptive intellectual assets can, even in the face of its own initial difficulties in deploying disruptive innovations in the marketplace, be able to later assume a leadership role in exploiting the disruptive innovation or at least establish a defensible position in the face of it.

Intellectual assets, particularly patents and to a lesser degree publications, can be used in a two-pronged approach to proactively deal with disruptive innovation at early stages, sometimes years before a corporation itself is willing to pursue the innovations commercially.

A team dedicated to seeking intellectual assets in disruptive areas need not develop technical breakthroughs and may not have the funding to solve complex technical problems, but, by understanding disruption and scanning for disruptive threats and opportunities, it is possible to identify disruptive applications of new technologies from other sources or to identify next steps in the advance of an entrant

technology and thereby to develop intellectual assets that can be leveraged to protect the interests of a corporation.

Low-cost efforts, such as targeted ''Invention on Demand'' (an IA-generation process developed by ipCapital Group [Williston, VT], licensed for internal use by Kimberly-Clark) sessions or simple development efforts based on reduction to practice of a patentable concept can be used to generate intellectual assets. Since the business model is often the key to whether a given technology is disruptive, business method patents based on ideation around new business models can significantly augment the IA-generation efforts. *Business method patents* is a loosely defined term that has become widely used since the Federal Circuit ruled in 1998 and 1999 that methods of doing business are not unpatentable per se. The term comprises many systems and processes involving transactions of information, especially computer-assisted methods such as e-commerce techniques, but can also refer to more general systems (see, e.g., Stobbs, 2002). At Kimberly-Clark, a cross-functional intellectual asset review committee focused on business method patents has played a critical role in generating future-looking intellectual assets to strengthen the approach to disruptive innovation.

Of course, such efforts can be much more successful when there are funds to pursue critical experiments or to support selected open innovation efforts in key areas. When such funds are needed, dealing with an imminent threat can often be a valid way to mobilize necessary resources. Efforts to pursue development beyond the level of ideation should be pursued in close cooperation with groups dealing with open innovation, university funding, and external partnerships. Ideally, a portion of funded external efforts will be deliberately aimed at obtaining intellectual assets in potentially disruptive areas where there may not yet be significant business interest.

However, when the business is not committed to a disruptive technology, proactive groups can provide significant value by identifying and pursuing patent opportunities aimed at preventing disruptive threats or laying a foundation for disruptive opportunities in the future. Tools to be deployed can include low-cost patents and publications aimed at enhancing a future patent clearance position and reducing the value of competitive investments in potentially disruptive areas.

Once a targeted area for IP generation has been identified, the necessary innovation can be assisted by asking inventors to focus on changes in customer needs that can result in new performance attributes becoming the drivers for technology change (Paap and Katz, 2004; Kim and Mauborgne, 2005). Understanding the job that consumers are actually doing can often lead to an understanding of how a technology can be applied in a disruptive way, resulting in concepts that can be fleshed out to generate intellectual assets. The IA generation process typically needs strong facilitation at this point to provide the framework for understanding disruptive issues and to craft a suitable IA strategy. Experienced facilitators and inventors with solid knowledge of the market, consumer insights, disruptive innovation theory, technology, and the prior art will be especially valuable in this effort.

Corporate support for the IA generation effort will generally most easily be found when there is an initial emphasis on averting risk (especially when it is at low cost). The risk aversion efforts, however, must be informed by a longer-term agenda of creating territory for protected growth. Maintaining flexible options for future growth is the key. Following the two-pronged approach to disruption, territory in the path of a potential competitive disruption is secured with intellectual barbed wire and other fortifications to keep competitors from using territory that could be valuable to them, but the longer-term vision is to retain an option to eventually harvest growth from that territory. Naturally, this requires a disruptive IA strategy team with the vision to understand how external technologies and potentially disruptive trends may impact the business and may eventually be desirable to the business. The goal is to lay a foundation early and at low cost before the business may acknowledge the desirability of the opportunity, because by the time a large corporation sees the business opportunity in a potentially disruptive area and reaches enough consensus to move forward, it is very likely that competitors, especially smaller competitors, will have already seen that opportunity and created intellectual property that could prove to be a costly barrier to one's own entry. The goal, then, is early defense, with a possible later transition to protected growth.

Insights from Kimberly-Clark's Efforts

In recent years, Kimberly-Clark has taken deliberate efforts to develop proactive IA strategies that can better position the company in a world of disruptive innovation. Efforts to consider and pursue broader

intellectual assets, including those around potentially disruptive innovations, have been undertaken in many parts of the corporation with high-level support. Kimberly-Clark has also vigorously sought to pursue disruptive innovations that can transform the markets in which it operates (Perkins, 2006). One key way of achieving this has been to vigorously pursue open innovation (Chesbrough et al., 2003), aided by a central team focused on alliances and technology acquisition, helping bring external technologies to Kimberly-Clark as it seeks to be a partner of choice in bringing these opportunities to market.

However, given the fact that Kimberly-Clark is a large corporation dealing with numerous established products in established markets, the company still faces the normal challenges in dealing with potentially disruptive threats and particularly in dealing with disruptive opportunities that might fall outside the normal areas of focus.

With the support of senior management, several initiatives have been undertaken to implement the principles previously discussed. For example, several groups in Kimberly-Clark have worked to give emphasis to the issue of disruption, looking for opportunities and threats that can be dealt with using low-cost IA approaches. This includes pursuit of IA across the supply chain. In several cases, it was found that early patents dealing with disruptive threats from a defensive standpoint proved to have value years later to a business unit.

The intellectual asset review committees in Kimberly-Clark all have written strategy statements that typically address the need to proactively pursue IA beyond the immediate, visible needs of the business and sometimes explicitly refer to the pursuit of disruptive innovation. For example, several years ago Kimberly-Clark formed a group called the cross-sector business method (CSBM) group with the mission of pursuing what is loosely described as ''business method patents.'' This cross-functional group meets regularly to consider business method strategy and to make filing and publication recommendations. In addition, CSBM works with many groups across the corporation to increase awareness of business method patents and the importance of pursuing intellectual assets around business models. The group has often taken up the issue of disruption, looking for opportunities and threats that can be dealt with using IA. A key activity of the group is looking for areas of business method activity in the corporation with disruptive potential and then working with the inventors—often people outside the R&D organization who are unfamiliar with patents—to pursue patents and other forms of IA in line with corporate strategies. Given that many people completely new to patents and IA strategy are involved, mentoring and facilitation efforts can be particularly important in generating the intellectual assets. Such efforts have resulted in intellectual assets dealing with topics such as new marketing methods, advances in Enterprise software systems, supply chain management, intelligent manufacturing, and applications of radiofrequency identification (RFID). Indeed, a major focus of the IA strategy in CSBM has been developing an RFID estate covering a variety of potentially disruptive areas, using a wide range of IA generation tools.

Some of the innovations generated in support of Kimberly-Clark's ''business methods'' strategy have led to licensing opportunities and to IP in potentially disruptive areas that later proved to be helpful for other business units. The two prongs, building a defense and laying a foundation for future growth, have proven to be valuable in several ways.

Another aspect of the approach to better using intellectual assets to deal with disruption has been to expand the scope of intellectual assets pursued, including implementation of an aggressive publication program. A variety of publications, including anonymous and named publications in various venues, have been part of the approach. Under this initiative, annual publications have increased dramatically, and IA teams have increasingly considered publications as an important part of their efforts.

Careful cross-sector review of patent applications and regular review of patent strategies for business groups have also helped increase awareness of threats and opportunities, sometimes leading to significantly strengthened approaches.

While much progress has been made, Kimberly-Clark is finding value in scanning the horizons for potential disruptive threats and opportunities and believes that proactive generation of appropriate intellectual assets, including patents, publications, and other tools for competitive advantage, will make the company better prepared for the future. Several positive results have already been experienced in which internal customers of disruptive IA strategy found, to their delight, that some foundational IP was already in place once their business unit determined that a particular technology or business model might be important for them (see Figure 1). It has also been found that some external groups have recognized the poten-

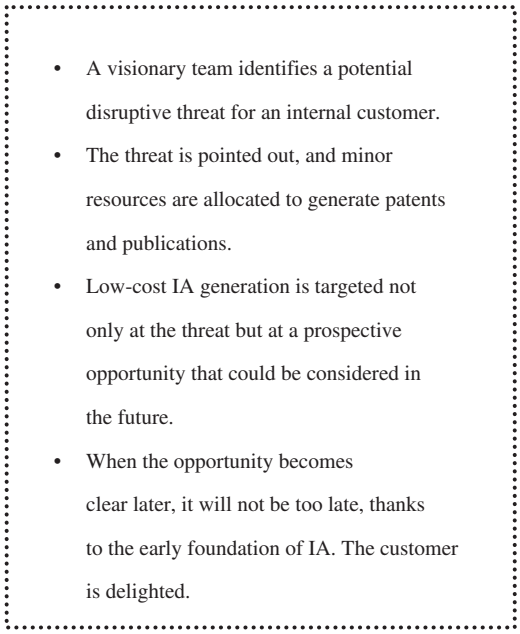

Figure 1: Customer Delight with Early Disruptive IA

tial value arising from the early and proactive pursuit of potentially disruptive innovations or potentially disruptive applications of emerging technologies.

Specific Recommendations for Generating and Drafting IA

By applying the theory of disruptive innovation to intellectual property, coupled with some experience, the following recommendations are offered regarding IA strategy, which may need to be adjusted based on, for example, company size, business strategy, and resources:

- The potential threats and opportunities of disruptive innovation should be a consideration in the IA strategy and activities of each business unit.
- It may be helpful to have at least one intellectual asset generating group charged with pursuit of ''disruptive intellectual assets'' to build an estate for both offense and defense. This group should work with other technical experts and IA groups to determine the potentially disruptive nature of emerging companies, services, products, and technologies and to tap into appropriate resources to secure intellectual property to protect against threats and possibly to obtain territory that may serve as a future launching pad for a corporation's later pursuit of a disruptive innovation.
- Since the disruptive nature of an innovation is often more related to how it is positioned in the marketplace than to the technology itself, consultation with representatives from marketing and others in the business may be needed to find or create disruptive business models and marketing approaches. This can be a critical part of exploring the disruptive potential of a technology or product rather than simply assessing performance advantages.
- Business method patents and protection of innovations from those outside of R&D may be increasingly important in the realm of disruptive innovations.
- New technologies and emerging companies should continually be scanned for potentially disruptive innovation that may be relevant to one's business.
- A global perspective is needed. In many cases, disruption emerges from the innovations required to bring products to global markets, following the concepts in *The Fortune at the Bottom of the Pyramid* (Prahalad and Hart, 2004). Efforts to understand the global marketplace and the different product needs of low-end customers or customers in nations with differing infrastructures and social conditions can lead to innovations that can later disrupt high-end markets.
- Patents should not be exclusively focused on the benefits that can be added to meet the needs of the most demanding customers. Intellectual property should be pursued for developments that better meet the needs of low-end users or provide new benefits to nonusers of a product type or service.
- Targeted publications must be increasingly used as low-cost ways of limiting the threats posed by competitors. Publications can be generated in new technology areas much more easily and at lower cost than patents or technical breakthroughs. Indeed, speculative publications and publications describing concepts and thought experiments that would be expensive to actually carry out can serve as prior art for some purposes. Since a publication costs far less than a patent to submit and archive in places searched by the U.S. Patent & Trademark Office, there is a compelling financial reason to generate low-cost publications to supplement patent efforts. The publications can enhance the value of one's estate by reducing the risk of competitive patents and can reduce the scope of competitive patents in areas of heavy competitive investment, possibly helping in the future should the company later choose to pursue the technology area.

Some of these recommendations can be implemented by training IA groups. Others may require a core group tasked with developing visionary intellectual assets that can achieve the two-pronged approach proposed here. Such a core group will need to work vigorously with other sectors to ensure that potentially disruptive threats and opportunities are identified and properly pursued. Ultimately, some group must feel the burden of disruption on its shoulders and, with support of visionary upper management, relentlessly take steps to reap the benefits or to avoid the threats offered by disruptive innovation. There must be an understanding that it may be years before the mainstream business appreciates any of the fruits of that effort, but, meanwhile, short-term benefits can be demonstrated in terms of risk reduction.

A proactive IA group may wish to follow the practice that Nissing (2005) calls ''strategic inventing,'' in which inventors determine where significant patentable opportunities exist based on the art and then work to create inventions in that field, focusing on market differentiation that may be leveraged for competitive advantage.

If patents are generated in prospective and possibly speculative areas, the issue of budget can be critical. In addition to avoiding excessive costs for filing numerous patents, the cost to maintain patents must be carefully considered. In many industries, it is likely that the time between filing a patent application and the due date for the first maintenance fee after the patent grants (a total span of typically five or more years) will provide enough time to make a reasonable forecast about the ongoing relevance of the issued patent, allowing less valuable patents to be trimmed before significant maintenance fees are accrued.

Summary

The striking success of some new products, including core products from Kimberly-Clark's legacy, can be attributed to disruption that provided benefits to consumers such as convenience and low cost while offering little motivation for incumbents to compete directly with the new product. Disruptive opportunities have been critical to Kimberly-Clark's past success but have also fueled and will continue to fuel competitors.

In reviewing the history of successful disruptive innovations in Kimberly-Clark's competitive space, these innovations may often come from the willingness of a few to explore the potential of a new group of consumers. The large market potential of the disruptive innovation was typically not appreciated before the product was brought to market but often was realized only after surprising feedback from the market, which sometimes pointed to completely different marketing approaches, such as using creped Kleenex tissue for uses other than cold cream removal. In many cases, the success of the innovation created new markets that attracted many new competitors. The existence of intellectual assets already in place has been vital for the success of some of these new businesses. In some cases, a small group with vision had generated intellectual assets that were in place before the business recognized the importance of an innovation.

In spite of past successes, the reality for most large companies is that disruptive opportunities are likely to be overlooked based on the values and systems (processes and metrics) that are designed to meet the needs of existing customers with sustaining innovations.

It is suggested that intellectual asset strategy be pursued as a means of managing disruption. Rather than seeking to directly overcome the natural resistance to pursuing disruptive products at an early stage, intellectual assets in disruptive areas can be pursued to reduce the risk of competitive disruptive efforts while also laying a foundation for future growth. The majority of these efforts may provide no visible gain for the corporation, but a cost-benefit analysis is likely to favor the aggressive IA approach given the low investment required to generate basic intellectual assets relative to the threats that can be mitigated or the occasional opportunity that comes to fruition.

In the burgeoning literature on disruptive innovation, further attention to the generally neglected issue of intellectual asset strategy is needed, and it is hoped that the thoughts shared here may be a step toward further exploration of this area.

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