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The Power of Peripheral Innovation

A Case Study of AmorePacific's Cushion Foundation

Shifting attention from a product's core to its peripheral components can open up new possibilities for innovation.

Bangsil (Esther) Lee and Jina Kang

OVERVIEW: The locus of innovation can be found in either the core or the peripheral components of a product. Most innovation literature has focused on innovation in core product components because improvements in peripheral components were believed to have only a minor effect on overall innovation or market outcomes. However, AmorePacific's "cushion," a liquid foundation-saturated sponge in a compact, demonstrates that peripheral innovation can create significant competitive advantage: the company's innovative sponges and puffs, peripheral components of its cosmetic products, generated sales revenue of \$542 million in 2014. AmorePacific's case suggests a four-step framework for implementing peripheral innovation. First, find customer hassles latent in the core components. Second, address those pain points by improving usability through peripheral components. Third, create synergy between the core and peripheral components. Finally, minimize costs associated with changes to peripheral components.

KEYWORDS: Peripheral innovation, Usability

The primary goal of industrial innovation is to create competitive advantage. Generally, companies focus innovation on the core components of their products—for instance, the chemical formula for a cosmetic foundation or other makeup product—believing that improvements in those elements offer the largest potential payoff. However, innovation in peripheral components—for instance, the applicators used to deliver a cosmetic product—can create

significant value as well. In fact, overlooking the potential of innovation in peripheral components can lead companies to miss opportunities for significant breakthrough innovations that can deliver value over the long term.

For instance, AmorePacific, Korea's top cosmetics firm, generated a significant competitive advantage from just a single product category by innovating peripheral components—makeup applicators. The company's Air Cushion¹ is a breakthrough innovation that offers a new, more convenient way to deliver liquid cosmetic products. AmorePacific's case demonstrates that peripheral innovation can yield meaningful value, even in mature industries, given a systematic approach and a clear focus.

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Peripheral Innovation in Practice

Research on category adoption and diffusion suggests that usability is an important determinant of product adoption (Rogers 1995; Babbar, Behara, and White 2002). Usability encompasses both the efficiency and effectiveness of use (Shackel 1984) and the degree of user satisfaction (ISO 1998). As Han and colleagues (2000) point out, product usability is affected by the characteristics of all of the product components. Therefore, it is essential to understand how each of the components of a product influences each dimension of usability.

Technological products are composed of basic components (subsystems) that are hierarchically linked (Clark 1985). Core components are those that are essential to the product's

¹"Air Cushion" is a registered trademark of AmorePacific.

There is growing evidence that innovative products can be driven by changes in peripheral components.

function; those that are not central to the product's intended function are referred to as peripheral components (Tushman and Rosenkopf 1992; Tushman and Murmann 1998). Innovation can be distinguished based on its locus—whether it is focused on core or peripheral components (Gatignon et al. 2002). However, the innovation literature has tended to focus on core innovation while ignoring peripheral innovation. For example, Tushman and Anderson use innovations in core components to describe a model of technological change and to discuss the product as a whole (Tushman and Anderson 1986; Anderson and Tushman 1990). This is at least in part because, as Tushman and Murmann (1998) argue, improvements in peripheral components are believed to have only a minor effect on other components and play little role in the overall innovativeness or competitive advantage of the product as a whole.

However, there is growing evidence that innovative products can be driven by changes in peripheral components. Nintendo's Wii and Samsung's Galaxy Note are two representative examples. The Wii revolutionized the video game console industry by embedding motion-sensing technology into the controller—a peripheral component. The simplicity of using familiar body motions to control the game enlarged the customer base, even attracting senior citizens to gaming. Likewise, the success of the Galaxy Note line of smartphones and tablets has been driven in part by the S Pen—again, a peripheral component that enabled users to interact more easily with the device that is the core product. The iconic stylus made it easier for users to take on-screen notes, draw pictures, and engage with their smartphones.

Peripheral innovation cases can be found even in mature industries such as the beauty and personal care industry. Teeth-whitening strips and hydrogel masks offer powerful examples of market-changing products made possible by peripheral innovation. Procter & Gamble's Crest Whitestrips² combine whitening gel—the core component—with a teeth-adhering plastic strip—the peripheral component—to make at-home teeth whitening easier and more convenient. Before the introduction of Whitestrips in 2001, at-home whitening systems relied on a tray to deliver the product. The tray was inconvenient for a number of reasons: it had to be worn for two to three hours to be effective, excess gel could trickle out of the tray, and it required cleaning after every use. Whitestrips removed these hassles by replacing the trays with disposable strips that reduced the required application time, eliminated excess gel,

²"Crest" and "Crest Whitestrips" are registered trademarks of Procter & Gamble.

and changed the landscape of the at-home teeth-whitening market.

Just as Whitestrips revolutionized at-home teeth whitening, another peripheral innovation, hydrogel masks, has driven rapid growth in the facial mask market in Korea. Traditional sheet masks are made of nonwoven fabrics. They were difficult to adhere to the face and couldn't prevent the embedded skincare ingredients—the core product—from evaporating. Furthermore, moving around while wearing the mask was difficult because the skincare ingredients oozed from the fabric. Hydrogel masks, by contrast, use translucent, elastic, jelly-like polymer substances, which adhere to the face without oozing, reducing evaporation and allowing customers to move around freely while wearing them. Since the launch of Genic's Cell-Derma, the first hydrogel masks, in 2007, the masks have steadily gained popularity in Korea. In fact, driven largely by hydrogel mask products, the facial mask market almost doubled in size in only three years, from \$90 million in 2007 to about \$170 million in 2010 (Hong 2014).

It is a common misconception that improvements in peripheral components have little to do with the overall innovativeness of a product. The cases of Wii, Galaxy Note, Whitestrips, and hydrogel masks prove this is not true. By rethinking peripheral components, each of these products addressed customer hassles in a way that improved product usability and created demand. In each case, the peripheral component, not the core component, was a primary driver for demand creation and differentiation. Particularly in these blockbuster products, peripheral innovations succeeded because they directly addressed customer hassles—frustrations and complications that limited usability and, hence, the market for a given product. Slywotzky and Weber (2011) argue that identifying and eliminating such customer hassles is one of the secrets of creating demand. This suggests that peripheral innovations, if properly considered from the beginning of the development process, can deliver a powerful competitive advantage.

Unfortunately, existing innovation models that mainly focus on core innovations provide little insight into peripheral innovations. There is as yet no framework or approach for structuring a peripheral innovation process. As a first step toward developing such a framework, we analyzed the case of AmorePacific's Air Cushion to investigate how an innovative product driven primarily by technological changes in peripheral components can create competitive advantage. We believe that the development process of Air Cushion can form the basis for a systematic approach that other companies can implement.

The Case Study: AmorePacific's Air Cushion

Air Cushion, released in 2008 under the auspices of AmorePacific's premium brand IOPE, is the world's first multifunctional cushion-type cosmetics delivery mechanism. Rather than delivering its product as a liquid or powder, Air Cushion is presented as a sponge saturated with the cosmetic. The product established a popular new category; it was eventually used to deliver a number of different cosmetic

formulations. In 2014, AmorePacific sold 26 million cushion compacts in 13 countries, generating 13.6 percent of the company's total revenue (\$3.98 billion). In a 2015 survey conducted by TNS Korea, 75 percent of Korean women between the ages of 20 and 50 responded that they had purchased cushion compacts (AmorePacific 2015). This widespread popularity shows that Air Cushion is a breakthrough product created through peripheral innovation. We undertook a case study to examine how AmorePacific identified and approached the challenges and opportunities in developing Air Cushion in an effort to develop a systematic approach for peripheral innovation (see "The Study," below).

Created to compete with a balm-type sunscreen product released by LG Household and Healthcare (LG

H&H), Korea's number two beauty company, Air Cushion eliminated a number of user hassles. Prior to the launch of LG H&H's product in 2006, most sunscreens in Korea were in the form of emulsions sold in tubes. The emulsions were sticky and thus inconvenient for consumers, as they had to wash their hands after using the sunscreen. LG H&H's balm-type sunblock, the first of its type in Korea, was applied with an accompanying puff, liberating consumers from the need to wash their hands after use. However, balms are difficult to apply evenly and lightly, and they tend to leave a dull finish compared to traditional emulsions. Thus, in designing its competing product, AmorePacific sought to resolve two contradictory consumer needs—the desire for portability and clean application, and the desire for even, light application. A compact case with a mirror and applicator is the best option for portability; balms are suitable in this context because emulsions can leak from a compact. However, emulsions are preferred to balms for light texture and even application. In short, there were clear trade-offs between conflicting consumer needs—customer hassles caused by the intrinsic characteristics of the core components.

The solution to the problem was inspired by stamp pads, which are made with a sponge-type material saturated with ink. An emulsion sunblock, researchers realized, could be retained in a compact without leakage by using a porous sponge to control the fluidity of the emulsion. After a lengthy search for appropriate materials and technologies, IOPE launched Air Cushion, a multifunctional sunscreen that offered the benefits of liquid foundation (light texture and even application) and a compact case (portability and convenience of use). After the success of Air Cushion for sunscreens at IOPE, the company extended the technology to other brands, such as HERA (luxury) and LANEIGE (premium), where it offered the cushion technology in makeup foundations. That expansion has continued; as of July 2015, AmorePacific had more than 40 cushion-based product lines, sold under 13 brands, with different ingredients and benefits. It has begun to build a cushion-based makeup product portfolio by applying the proprietary technology to other makeup products, such as eyeliners, concealers, and blushes (Table 1). In July 2015, the company set up Cushion Laboratory, an R&D team dedicated to developing the technology and exploring its application to skincare products.

The company has also deployed its technology in strategic alliances and licensing agreements with other companies. It signed a Memorandum of Understanding with Parfums Christian Dior, a French cosmetic company, to provide Dior with cushion technologies; AmorePacific plans to leverage this partnership to increase brand awareness in Europe and North America. The company has also pursued a cooperative strategy with local rivals, for instance by entering into a mutual nonexclusive license agreement with LG H&H in November 2015, under which AmorePacific grants LG H&H the right to use its cushion-related patents and, in return, LG H&H

The Study

To explore AmorePacific's development of Air Cushion, we conducted a qualitative case study of the project. The primary source of data was a series of semi-structured interviews with senior executives and managers in R&D and marketing who were involved in the Air Cushion development project and executed its subsequent extension into other brands. We carried out a total of eight interviews, each of which lasted an average of 80 minutes.

The interviews asked about how the cushions were created, how opportunities were identified, what key technologies were involved, what challenges were encountered and how they were overcome. All the interviews were recorded and transcribed.

Prior to the interviews, we examined secondary data gathered from newspapers, magazines, patents, and the company's official website, as well as internal materials provided by AmorePacific, such as market research data and in-house newsletters. These secondary data suggested directions for interview questions and facilitated further comments and clarifications during the course of the interviews.

The interview transcripts were read through several times by each researcher, working independently, to identify common themes. In these read-throughs, researchers sought to identify the main ideas being communicated by looking for high-frequency words and phrases, such as "customer hassles" and "usability" and examining the context of their use. For example, researchers found that when "customer hassles" appeared in a transcript, the associated content was typically concerned with the structural constraints of core components, and paragraphs containing the word "usability" generally focused on peripheral components. We analyzed each of these ideas in terms of the innovation locus—whether they were focused on core or peripheral components. By organizing these ideas and related innovation activities based on a hierarchical system of product components, we built a map of the case process—identifying hassles, improving usability, creating synergy, and controlling costs—and derived the four-step framework that forms the basis for this article.

Finally, in order to maximize the reliability of our analysis, we asked interviewees and others at AmorePacific to review a preliminary draft of our report.

TABLE 1. AmorePacific's strategy for diffusing cushion technology across its portfolio

Brand (Product)	2008	2009	2010	2011	2012	2013	2014
IOPE (Air Cushion)	Developed cushion-type sunblock	Introduced sweat-proof function	Increased amount of emulsion in sponge	Modified sponge material to improve durability	Offered enhanced foundation makeup in cushions		Expanded cushion technology into blushes
HERA (UV Mist Cushion)					Introduced cushion-based foundation makeup	Initiated marketing campaign for cushion-based foundation	Expanded cushion technology into eyeliners
LANEIGE (BB Cushion)					Entered overseas market with cushion-based foundation	Tailored product to needs of international customers	Expanded cushion technology into concealers
Strategy	<i>Focus on single brand/technology development</i>				<i>Extend technology to other brands</i>		<i>Diversify portfolio</i>

permits AmorePacific to use its patents for teeth-whitening strips.

The scale of Air Cushion's success was not anticipated; even Suh Kyung-Bae, chairman of AmorePacific, said at the press conference for the company's 70th anniversary in 2015 that he had not expected that cushion products would become such a global success. The development of Air Cushion started as one of many ordinary new product development (NPD) projects, following AmorePacific's usual five-step process: identification of marketing opportunities, generation of new product ideas, screening of new product concepts, market testing and sales forecasts, and launch (Hwang 2004). At first, the company focused its attention on the cosmetic formula—the core component. However, the development team recognized that the trade-offs inherent in contradictory consumer needs could not be solved by technological improvements in that core component. Ultimately, the company turned its attention toward makeup applicators—peripheral components—a shift that resulted in a truly innovative product. Although AmorePacific did not structure a formalized process specifically geared toward peripheral innovation, the way that the company changed the direction of its innovation efforts—beginning with core innovation, then shifting its attention to peripheral innovation, and continuing to upgrade the peripheral components after product launch—suggest a possible approach to implementing peripheral innovation more systematically.

In designing its competing product, AmorePacific sought to resolve two contradictory consumer needs—the desire for portability and the desire for even, light application.

Start With a Core Innovation Project

In January 2007, AmorePacific initiated an NPD effort to develop its own balm-type sunblock to compete with LG H&H's product. The main objective of this project was to launch the product as soon as possible in order to restore the company's competitiveness in the sunscreen market. At that time, balm-type sunscreens were already a proven success; LG H&H's product had generated sales revenue of \$13 million within 10 months of its release. Given that AmorePacific was a latecomer in this niche, time-to-market was particularly important.

Researchers and marketers worked closely together under AmorePacific's established brand manager system, in which a brand manager is responsible for developing the overall marketing strategy for a new product (Hwang 2004). Based on initial consumer research, the team planned to develop a differentiated balm-type product by adding supplemental features, such as cooling effects. With this in mind, team members focused on studying ingredients and compositions of balms—the core component. However, it soon became clear that there were significant structural constraints embedded in the balm formula: balm is hard to apply evenly and lightly due to its intrinsic characteristics. Furthermore, with use the balm can become unattractive because dust tends to cling to the surface. Although the accompanying puff made balms efficient to use, the intrinsic limitations of the oily formula led to less than satisfactory results on the skin. In short, balm-type sunscreens were problematic from a usability perspective.

Given these inherent limitations, the development team reasoned that improvements in the balm formula itself would not significantly increase customer value, no matter how many supplemental features were added. Although IOPE, one of AmorePacific's premium brands, succeeded in developing its own balm formula by June 2007, the product was not released to the market. Instead, concluding that a fundamentally different solution was required to address the customer hassles that came with the balm format and create meaningful value, the company decided on a different approach.

Shift Toward Peripheral Innovation

The joint team from marketing and R&D engaged in numerous brainstorming sessions seeking solutions to address the customer hassles it had identified. The main objective was to ameliorate usability deficits in core components. At this point, the deadline was tight—management wanted a new product by February 2008 because new products in the sunscreen category are usually launched in spring. Given this time constraint, technological improvements in the core components seemed unlikely. Thus, the team began to investigate the possibilities of mitigating the usability deficits in core components through peripheral components—specifically, applicators such as sponges and puffs.

Ultimately, the team arrived at a creative solution inspired by stamp pads—combining an emulsion product with a sponge that allowed the emulsion to be packaged in a compact case without risk of leakage. This solution mitigated the trade-offs between equally desirable but mutually exclusive consumer desires, by allowing an emulsion product to be packaged as a compact and used without soiling the hands. Combining an emulsion with a sponge and delivering it through a puff creates synergy and brings value to customers.

The key to maximize that synergy was to find the right materials for applicators and to wholly integrate the emulsion with the sponge. The first challenge was to find the ideal sponge material. The sponge had to be able to hold a sufficient amount of emulsion at a size small enough to fit into a compact case; the *de facto* standard amount for sunscreens in Korea was 30 grams; a smaller amount might limit the perceived value of the product. The key indicator for a material's suitability, then, was its absorptiveness. The material also had to control the fluidity of the emulsion: the liquid should not flow out of the sponge when it was not in use, but had to ooze out of it easily when pressed on by a puff. After collecting approximately 200 material samples, researchers conducted experiments to find a material that fit these criteria. After approximately 3,600 tests, polyurethane foam, generally utilized inside powder puffs, was identified as the optimal choice.

Additionally, the company needed to develop filling techniques for the cushions, to facilitate production. In general, the techniques involved in cosmetics production can be divided into manufacturing and filling (Knowlton and Pearce 1993). Manufacturing techniques are closely related to the core components and generally perceived as more important and more complex than filling techniques. However, cushions require a more sophisticated filling technique than the usual practice of simply injecting the cosmetic into a container, and the filling technique is central to the eventual usability of the product. The sponge must be saturated with the optimal amount of emulsion as homogeneously as possible. The product quality will be damaged if emulsions are not evenly absorbed throughout the sponge or if they leak during use.

The problem was that no such filling techniques existed. During the initial prototype testing, the product developers dipped the sponges into the emulsions one by one, by hand. Producing the Air Cushion at scale required a new

Keeping a clear focus on the hierarchy of product components from the beginning of the innovation process will help reveal opportunities for peripheral innovation.

filling technique and equipment, both of which have been patented by AmorePacific. This technique provided a minimum of 12 grams of emulsion. Instead of investing more time and money to develop advanced filling techniques that would increase the amount of emulsion per sponge, AmorePacific decided to launch the product as it was. Given the novelty of the product, the management believed that it would be better to verify consumer demand by launching the product with an included refill, for a total of 24 grams of product per purchase, than to delay the launch to reach the preferred emulsion amount.

Researchers also conducted experiments to identify a suitable material for the applicator. Ultimately, the team settled on a microporous material that applied the emulsion evenly and lightly while minimizing absorption of emulsion from the sponge. The problem was the high cost. The microporous foam used for the applicator was nearly five times more expensive than the synthetic latex usually used in such applicators. The development team overcame this issue by creating a three-layered design for the puff that used the expensive wet-type polyurethane only for the bottom layer, where it was in contact with the emulsion. Cheaper materials formed the center layer and the top. This creative approach reduced the cost of the applicator to an acceptable level.

Upgrade After Product Launch

After launching the world's first cushion-type cosmetic products in March 2008, AmorePacific continued to improve the key technologies for cushions, paying special attention to strengthening the ties between the core and peripheral components. For example, the company strove to stabilize the filling operation, leading to an increase in the amount of emulsion per sponge to 15 grams in 2010. The sponge was upgraded as well, with the polyester-based polyurethane foam initially used replaced by polyether-based polyurethane foam in 2011, which improved the durability of the sponge and the stability of the emulsion within it.

Furthermore, the effectiveness of the sunscreen was improved from SPF 40/PA++ in 2008 to SPF 50/PA+++ in 2010.³ The foundation coverage degree and color range

³SPF, or Sun Protection Factor, is an international standard for measuring the effectiveness of sunscreen against UVB rays; the higher the SPF rating, the more effective the sunblock function is. PA is a grade measuring effectiveness against UVA rays. PA ratings are indicated with plus symbols; the more plus symbols, the more protection the product provides against UVA radiation.

Achieving successful peripheral innovation requires a process and an organizational structure that supports this approach.

were broadened as well to meet diverse customer demands. All of these improvements provided a strong foundation for the company to expand cushion-related technologies into other brands and more advanced and diversified products. As a result, AmorePacific successfully established cushion-based cosmetics as a product category.

A Framework for Peripheral Innovation

Although Air Cushion was not the intentional outcome of a structured process for peripheral innovation, it does represent a very successful peripheral innovation. Our analysis of the case shows that the innovation process for Air Cushion evolved in four steps: identify hassles, improve usability, create synergy, and control costs (Table 2). First, AmorePacific defined the structural constraints of core components that created customer hassles. Then, the company tried to resolve these hassles and improve usability through peripheral components. Next, AmorePacific strove to create synergy and enhance customer value by strengthening the linkage between the core and peripheral components. Additionally, the company developed a creative idea to minimize the cost of the puffs and thus make the product competitive with offerings already on the market. This four-step process suggests a possible approach for implementing peripheral innovation in practice (Figure 1):

1. **Find customer hassles latent in the core components.** The importance of understanding customers in peripheral innovation cannot be emphasized enough. In implementing peripheral innovation, need finding should be the starting point. Design thinking, a human-centered methodology to problem solving, offers one approach that starts with empathizing with the user and identifying user needs (Brown 2008; Seidel and Fixson 2013; Liedtka 2014). Need finding may also be deployed in NPD more generally, but in peripheral innovation, focus should be placed on the complete hierarchical system of

the product and the interactions between the core and peripheral components. Innovators should not only observe user behavior and experience, but also investigate the structural constraints embedded in the core components and the customer hassles these constraints create. AmorePacific pursued this principle in seeking to address the customer hassles created by the inherent limitations of the balm format.

2. **Investigate possibilities for improving usability through peripheral components.** Improving usability is one way to eliminate customer hassles. Customer hassles, especially those caused by the structural constraints of core components, can be solved either by technological breakthroughs in the core or by innovation in the peripheral components. Peripheral components can be designed to address the hassles created by structural constraints; thus, looking at those constraints and usability deficits can suggest where peripheral innovation may yield competitive advantage. AmorePacific created a breakthrough product by shifting its focus to the potential for the makeup applicators to resolve a persistent usability challenge.
3. **Create synergy between the core and peripheral components.** Peripheral innovations become powerful when they are inextricably linked to the core components of the product in a way that makes the product as a whole more useful, more usable, and more innovative. Once a solution is identified, prototyping and experimentation are required to explore how the concepts for peripheral components interact with the core product components. This stage is in some ways analogous to the last stage of the design thinking process (Liedtka 2014). The difference between the testing stage in design thinking and this stage in peripheral innovation is that in peripheral innovation particular attention should be given to the linkages between the core and peripheral components. As Henderson and Clark (1990) point out, even seemingly minor innovations can significantly affect existing markets if they reshape a product’s architecture—the ways in which its components are integrated. The key to the success of Air Cushion is the linkage of the product components—that is, the way in which the emulsion product works with the sponge and cushion applicator. Taken together, these various elements create an entirely

TABLE 2. AmorePacific’s innovation process for Air Cushion

Consumer need: A product that (1) is easy to carry, (2) applies lightly and evenly, (3) applies neatly, with no need to wash hands after use.

Step	Context
1. Identify hassles.	Define structural constraints embedded in core components. <i>Emulsions are good for light texture but bad for portability. Balms are portable but too heavy in texture.</i>
2. Improve usability.	Create solutions to address customer hassles. <i>Sponges can control fluidity of emulsions, making them portable.</i>
3. Create synergy.	Develop technology to strengthen the linkage between components. <i>Testing was required to identify the optimal material and develop production capabilities.</i>
4. Control costs.	Address and minimize cost burdens associated with peripheral components. <i>A multilayer structure was adopted to minimize the cost of puffs.</i>

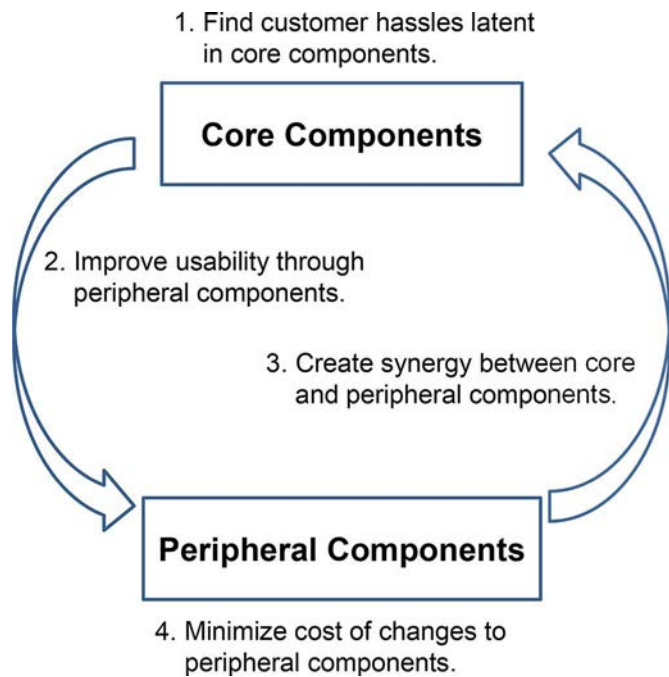


Figure 1. A four-step process for peripheral innovation

new product in a category that appeared to have matured. The synergy generated through the right linking mechanism can magnify the impact of peripheral innovation. As compared to traditional human-centered design methods, which do not often lead to radical innovation (Norman and Verganti 2014), a more calibrated approach in testing prototypes, with a specific focus on the synergy between components, will increase the likelihood of breakthrough innovation at the product level.

4. **Minimize the cost associated with changes to peripheral components.** Ultimately, to be sustainable in the market, peripheral innovations must deliver enough value to allow the company to recoup their costs and generate a profit. An innovation that is too expensive to produce will not survive in the market, even if it represents a huge improvement in usability or eliminates significant consumer hassles. Therefore, it is important to explore—and minimize—the cost impact of a peripheral innovation.

This four-step framework represents a good foundation from which to develop a systematic approach to peripheral innovation. Keeping a clear focus on the hierarchy of product components from the beginning of the innovation process will help reveal opportunities for peripheral innovation and allow NPD teams to exploit those opportunities when they emerge.

Lessons Learned

AmorePacific shifted its focus to explore the possibilities of innovation in peripheral components very early in the development process for its new sunblock product. As a result, the company arrived at a strong product concept through close work between researchers and marketers,

an approach facilitated by the company's existing brand manager system. The idea was developed through rapid prototyping and experimentation within a short time frame. AmorePacific's experience in developing and marketing cushion technology suggests three primary lessons for others looking to capture value through peripheral innovation:

- *Consider the possibility of peripheral innovation from the beginning of the technology development process.* Peripheral innovations are often relegated to afterthoughts or add-ons. For instance, Golish, Besterfield-Sacre, and Shuman (2008) divide the technology development process into five stages—conceptualization, design and development, prototype testing, production, and lifecycle management—and suggest that peripheral innovations should be considered only in prototype testing. However, as AmorePacific's experience demonstrates, systematic consideration of peripheral innovation from the conceptualization phase can lead to breakthroughs, even in apparently mature industries and product categories, based on a close synergy between the peripheral and core components.
- *Integrate R&D with marketing.* AmorePacific has a long history of integrating technology and marketing; brand managers in the marketing department routinely work closely with R&D from the beginning of the concept development process. This integration was a key factor in the company's success competing against global firms (Hwang 2004). It was also a key factor in the development of Air Cushion. Joint brainstorming sessions that included both marketers and researchers led first to the refocusing of the effort on peripheral innovation, based on consumer input, and then to the Air Cushion concept itself. Without an organizational system that facilitated cross-functional cooperation, the opportunity for peripheral innovation might never have been identified or exploited.
- *Foster a fast, agile development process.* AmorePacific was wise enough not to waste too much time and resources attempting to create a perfect solution before getting a product to market. Instead, the company focused on rapidly building prototypes and launched a product with a minimum set of features—24 grams, SPF 40, PA+++. After the initial launch, the firm continued to improve the product iteratively and incrementally to meet customer needs and expand the feature set. A quick, responsive development process like this minimizes the risk of peripheral innovation. This is specifically important because peripheral innovation can be perceived as more risky than core innovation activities. Agile development approaches allow management to shorten the development cycle and minimize waste practices, thus maximizing the value that can be captured from peripheral innovation.

Clearly, innovating peripheral components will not always lead to a breakthrough success. However, it does present

opportunities to build competitive advantage by removing customer hassles and creating differentiation. Achieving successful peripheral innovation requires a process and an organizational structure that supports this approach. Management must make an effort to foster cross-functional cooperation and establish an appropriate process to encourage attention to the potential for peripheral innovation.

Conclusion

Facing competition from a new product that resolved one set of consumer hassles, AmorePacific took a different path than its competitor had. Whereas LG H&H focused on core components, developing new sunscreen formulations to address particular usability challenges, AmorePacific paid special attention to the peripheral components of the product and produced a breakthrough. LG H&H preceded AmorePacific in identifying customer hassles, but in dismissing the potential role of the delivery mechanism in resolving those hassles, it missed an opportunity. As a result, AmorePacific launched an entirely new product category while LG H&H's balm-type sunscreens waned in popularity after a brief fad.

Firms are too often preoccupied with innovating core components and fail to notice the potential of innovation in peripheral components to create breakthrough products, competitive differentiation, and significant market value. However, as the story of AmorePacific's cushions demonstrates, innovation on the peripheral components of a product can lead to the creation of new product categories and sustained market leadership. The four-stage innovation process we suggest in this paper will guide business practitioners in pursuing peripheral innovations. The real merit of peripheral innovation has not been appreciated properly in the technology development process. It is time to recognize its true worth and rethink how to manage peripheral innovation.

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